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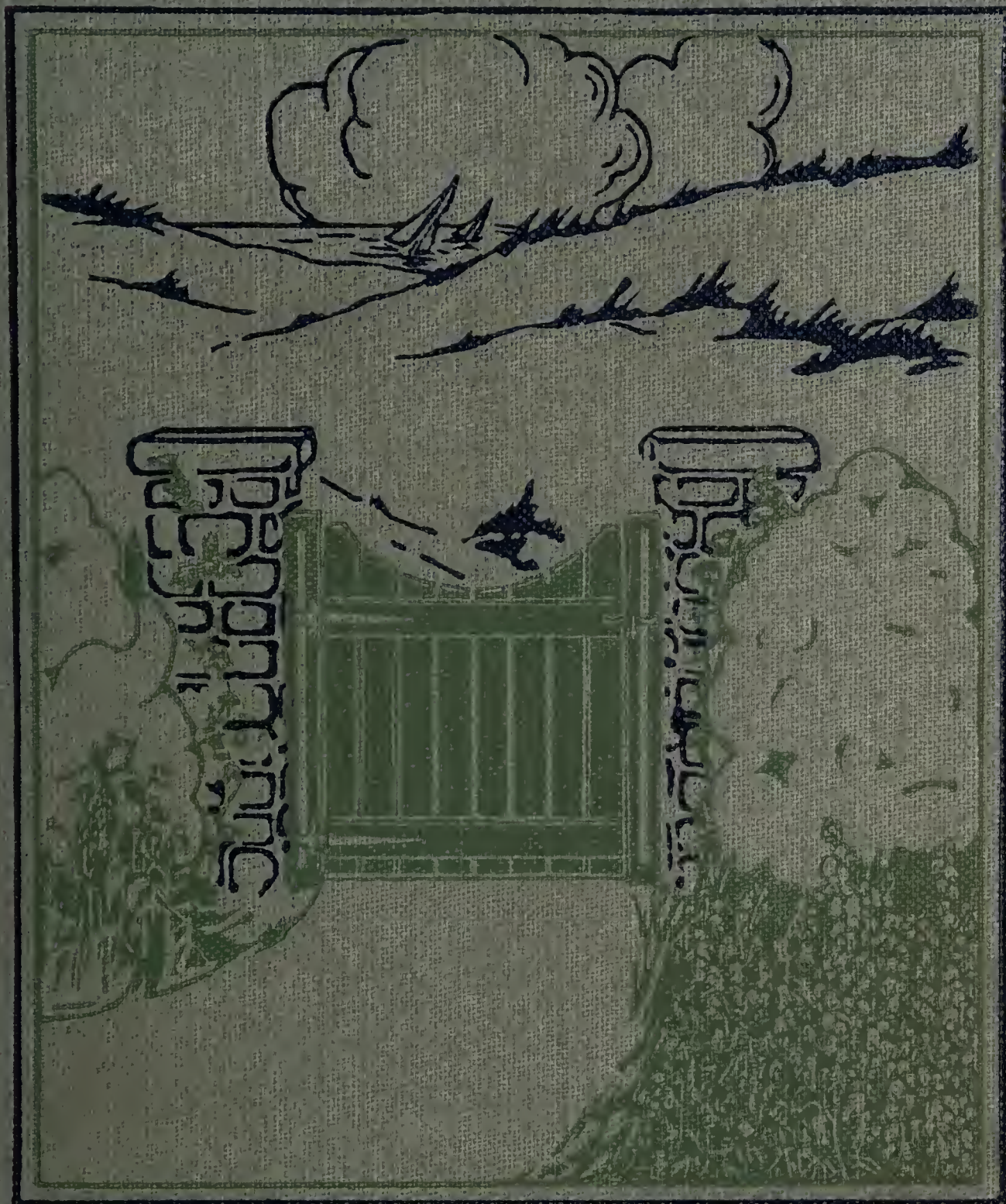
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# GREEN GATE TO THE SEA



ETHEL C. BROWN





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# THE GREEN GATE TO THE SEA

BY

ETHEL C. BROWN

Author of "The So-and-So Family,"  
"The Three Gays," etc.

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## THE GREEN GATE BOOKS

IN the Green Gate books you have only to swing open the little green gate cover and you will find the paths that lead to the sea, the fields and the woods.

Your own house may not have a real green gate, but it has paths that lead to all the interesting out-of-door places. They may not look at all like paths to you. City children often have to take a trolley car instead of a foot-path when they go to the seashore or the woods. Many children who live right in the fields or woods have to travel for days on a railroad train before they can catch a glimpse of the ocean.

If the paths are short ones, travel them often, until you find all the interesting and curious plants and animals described in these Green Gate books, and discover something about each one that isn't in these books or any other books you have seen. If you live too far from



the country and the seashore to take these paths now, read here what you will find when, some day, you are able to walk through a real gate to the fields, or the woods, or the sea.

JEAN BROADHURST



## THROUGH THE GATE

LONG ago I stepped through the Green Gate, just as Elinor and Philip did, and found myself in the great world of Out of Doors, full of beautiful sights, mysterious sounds, and hidden wonders more marvelous than the fairy books tell of.

The first path that I took was the Path to the Sea. I have followed it many times since then. Each time that I have done so I have learned something new about the sea creatures that I found there. I am still learning, and the more I come to know about them the more wonderful they seem.

In describing what Elinor and Philip found I have told of things that any child might find on the sea beach. I hope that, as they grow older, the children who read this book and study the pictures I have drawn will want to learn more and more about these sea creatures, just as I have done, and as Philip and Elinor want to do.

ETHEL C. BROWN

“And when they reached the garden gate,  
Now what I say is true — ”



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## ROCK POOLS

Climb on the rocks when the tide goes down,  
Over slippery seaweeds green and brown ;  
Brush them aside and search with care,  
A sea pool's sure to be hidden there.  
Then — down on your knees ! Lean on each hand,  
And gaze through its depths into Fairyland !

Through its crystal window you may see  
Green lights that glimmer fitfully ;  
Swaying curtains of silken sheen :  
A floor encrusted with pink and green ;  
Carpets of moss of a dozen hues,  
Grays and ambers and reds and blues.

Soft sponges are fastened high and low ;  
Little red crabs run to and fro ;  
There's a sea anemone spreading wide  
Its flower-branches on either side :  
Beautiful shells lie here and there :  
Sea-things wonderful, strange, and rare.

Into this world of awe and wonder  
Crashes a wave with a noise of thunder.  
From head to foot you are splashed with spray ; —  
But look back once as you hurry away ;  
For the rock pool now, with the incoming tide,  
Is a part of the ocean deep and wide !







## I. THE SEA BEACH

ONE summer Elinor and Philip went to live in a big white house by the seashore. The house had a garden around it, and all around the garden was a high fence, with bushes and flower beds in front of it.

Elinor was eight years old. She had golden hair that curled all over her head and about her face.

Philip was nearly six years old. He had straight hair that fell down in straight lines. Philip was not so tall as Elinor. His head came about up to her shoulder.

The day after they all went to stay in the big white house, Elinor and Philip went to play in the garden. It was a lovely garden, with trees and rose bushes and bright-colored flowers growing all about. There was green grass, too, and gravel walks leading in different directions.

The children played for a while, running along each one of the paths in turn to see where

it led. Finally they came to a path that led straight toward the far end of the garden.

“Let’s go along this path and see where it leads,” said Elinor. “It is wider than the others. Perhaps it goes away off somewhere.”

“Oh, perhaps it leads the way to the door of the garden! I would like to see what is outside,” said Philip.

So they started along the gravel walk. It grew prettier and prettier as they got farther and farther away. Then, all of a sudden, the path ended with a little Green Gate! It was so high that Elinor had to stand on tip-toe in order to see over. Philip had to climb on the bars before he could see over the top.

“Oh, where do you suppose it leads to?” asked Philip.

“I see a path leading straight ahead, and another path leading over toward the right, and another path leading over toward the left,” said Elinor.

“It looks pretty out there. Let’s open the gate and see where the paths lead,” said Philip, jumping down from the gate.

“Listen!” cried Elinor. “I hear something!”



Philip stood very still and listened. From straight ahead he heard a booming sound every few minutes. It seemed to come from quite near.

“It sounds like *boom! boom! boom!*” said Philip.

“Yes,” said Elinor, “and it comes from somewhere along the path that leads straight ahead. Now listen again.”

“I hear a sort of whispering music, like soft singing. Why, it sounds like Uncle John playing on the violin,” said Philip.

“Yes, like an orchestra playing away off somewhere. Now listen again. That sound came from the left-hand path.”

“Over toward the right I hear a tiny buzzing and humming. Oh, away off, ever so far,” said Philip, half closing his eyes, the better to hear.

*Boom! boom! boom! rumble!* came from the middle path. It sounded much louder and nearer than the other sounds.

“Let’s go!” cried Philip again.

Elinor looked doubtful.

“We ought to ask Mummy first,” she said.

“Oh, she wouldn’t mind. Let’s go just a teeny weeny way!”

Philip climbed down from the bars and tried the latch of the gate.

“Wait. I am going back to ask Mummy if we may go,” said Elinor.

Philip had been pulling and tugging at the latch. But the gate would not open!

“All right. Let’s go and ask her,” he said.

So the two children started back along the gravel walk to find their mother. And there she was, coming along toward them! She had in one hand a little red pail and shovel, and in the other a little blue pail and shovel. She handed the red one to Philip and the blue one to Elinor.

“So you waited for me! I am so glad you did not want to go along the path without asking me,” she said. “You could not have unfastened the gate without me, dears.”

Philip hung his head a little.

“Which of the three paths did you want to take?” she went on.

“Oh, Mummy! The path on the left made a singing sound, like music!” cried Elinor.



“And the path on the right sounded like soft humming, away, away off!” said Philip.

“But the path straight ahead?” asked Mummy.

“Oh, from the path straight ahead there came a booming sound,” said Elinor.

“It came from quite near. Oh, can’t we go, Mummy?” said Philip, holding tight to his pail and shovel.

“Yes, we will take the middle path, dears,” said Mummy.

She reached down and unfastened the latch. The gate flew wide open!

The path led uphill for a little distance. They could see nothing but the blue sky beyond. But in a minute they stood on the top of the hill. Then the children gave a great shout of delight. For there, below them, was a lovely sea beach, covered with white sand.

*Boom! Boom! Splash!*

A big wave came rolling up the beach, burst into a mass of sparkling foam and then fell back.

That was the sound that Elinor and Philip had heard from the direction of the middle path.

You may imagine how delighted Elinor and Philip were. For they had lived far away from the ocean and had never seen it before! They jumped right up and down. Philip clapped his hands, and dropped his pail and shovel on the soft, white sand. How hot the sand was, and how soft and fine! It was fun to tumble about in it. They could hardly wait to take off their shoes and stockings, and to have their clothes pinned up, before they ran down the beach towards the water's edge. It was a long way down. The tide was coming up very fast.

As they came nearer the water the sand grew harder and firmer, and darker in color. It was damp. They laughed to see their footprints in long lines behind them. Then the sand suddenly grew soft and very wet. They were standing right at the edge of the ocean!

A big wave came rolling after them. They turned and ran away as fast as they could. But it was not easy to run in the wet sand. Philip stumbled over a stone and fell flat. The salt water dashed all over him. His pail and shovel went floating backward with the wave. But another wave brought them back and

flung them at his feet. Every second or third wave seemed to reach a little higher than the ones before it. The tide was coming in.

After the children had played for a while in the water they went a little way up the beach. Elinor found a stick and began to draw pictures on the sand. First of all she drew a picture of Daddy. Then she made a picture of Mummy, holding on to his hand. Then she made one of herself.

“Make curly hair — awfully curly hair,” said Philip, seizing a stick and helping make curls.

“Oh, but my hair doesn’t look like that,” said Elinor.

“Doesn’t it?” asked Philip, looking at it critically.

“Never mind,” said Elinor, “I’ll make a picture of you, now.”

So she made a picture of Philip.

This is the way the picture looked:



By and by they sat down on the sand and made a fort. First they made a mound of sand. They patted it down and rounded it off nicely. They stuck a flag on top. The flag was a piece of seaweed. Then they hollowed out a trench all around the fort. There was an opening in front, with a little bridge over it. The bridge was a stick.

“Let’s make a long trench down to the water,” said Elinor.

But before the trench was half done they found it full of water!

“Where does the water come from?” asked Philip, looking around in surprise. The waves did not come up nearly so far as the trench.

“It’s from the ocean. It must be coming up underneath. We must have dug down as deep as the water level — Oh!”

No wonder Elinor cried out, for the water came pouring into the trench that surrounded the fort. In a moment it was full. Looking up, they saw that the tide had come up while they had been digging, and there was the ocean almost at their feet! *Splash!* came a wave, and dashed all over the fort.



“What makes the tide come up?” asked Philip.

“Why, it has to. It can’t help it. Oh, look! It is covering up our pictures! And I wanted to show them to Mummy!”

“Take care, children!” called their mother’s voice. “The tide is coming up fast. Come, let us sit down in the shade under the awning. It is nearly time to go home for luncheon. Take care, Philip! There is a strong undertow. When the wave draws back see how it drags big stones along with it. It might draw you back in just the same way, and throw you off your feet.”

“What makes the tide come up so fast, Mummy?” asked Elinor, as they sat under the shade of the awning, in the soft sand.

“The water covered up our pictures and our fort,” added Philip.

“The tide has to come up just so far each day,” said Mummy. “It is nearly high tide now. Do you see that long line of seaweed stretching across the beach? That is the high water mark. It does not often go higher than that except during a storm, or at a very high



tide. See how small the beach is getting. A wave will soon touch the seaweed, and then you will know that it is high tide. We will wait for that, and then go home."

Up came a big wave and nearly reached the line of seaweed. Then came several smaller ones.

"Count six small waves, and there will soon come a big one," said Mummy.

So they counted one-two-three-four-five-six!

*Boom! boom! splash!* came a big wave.

"What does it do when it is high tide?" asked Philip.

"It goes down again, step by step, just as it came up. It is now eleven o'clock. In six hours it will be low tide again. At five o'clock it will be down by that large white rock there. After that it will come back again. That will take another six hours."

Elinor began to cover Philip up in the sand. It was much finer and softer than it was near the water. Soon only Philip's head could be seen. He looked very funny.

"Why is the sand so fine and white up here?" asked Elinor, sifting it through her fingers.

“What is sand made of, anyway?” asked Philip, popping up suddenly, and shaking it off in a great shower.

“Some of it has been ground and ground by the waves until it is fine like this. It takes a long time. Can you guess what sand is made of?”

“Some of it is little fine stones and shells, isn’t it?” asked Elinor, looking at a handful of it.



A broken shell of a sea snail (*Natica*). This is the snail that makes a round ring or collar of sand to hold its eggs, which are mixed in with the sand.

“Exactly. Look at that rock in the water. Each wave that dashes against it breaks off a tiny bit, probably. It crumbles off and falls on the beach. Then up come the waves and roll it back and forth, up and down. It gets smaller and smaller and smoother and smoother

as it is flung against other stones and shells. At last it is a grain of sand. Of course the softer parts of the rock crumble off first, but they may take the harder pieces with them. Some of these grains are as hard as crystal."

"My! But it must have taken a long time!" said Elinor, looking about at the gleaming whiteness all around them, and thrusting her arm into it as far as her little elbow.

*Boom! Splash!*

*Crackle-crackle-crackle-swish-swish-swish!* went the pebbles as they rolled and tumbled and raced backward down the beach after the waves, only to be hurled forward again the next moment.

The wave had reached the seaweed. It was high tide!

"Next week there will be a new moon. Then we shall have tides that come up very high and go out farther. They will do the same at the time of full moon. These tides are called 'spring tides.' They come twice a month, you see."

"So that is how the pebbles get made into sand!" said Elinor, picking up a smooth stone.

“If you had been softer you would have been ground into fine sand long ago, wouldn’t you, little pebble?”



Two sea snail shells, worn and broken by the waves. The black spot in the smaller one is a hole which another snail bored through the shell in order to eat the animal inside.

“Let us carry home some sand and look at it through the magnifying glass. Then you will see something interesting,” said their mother.

So Philip and Elinor each put a shovelful of sand into the pails, and they put in other things, too; shells and seaweeds and stones.

“See my pretty stone!” cried Elinor, holding up the round pebble that she had picked up a little while before.

“Some people would call that a ‘lucky stone,’



for it has a stripe around it. It is a very pretty piece of jasper," said her mother.

"I am going to keep it always," said Elinor.

They left the beach and walked up the plank walk, down the hill, through the Green Gate, and up the garden walk to the big white house.

"There is just an hour to luncheon time," said their mother. "When you are washed and dressed I think I will ask you a few questions about what you have seen and learned this morning. Come, now, and look at our sand."

The children could hardly believe their eyes when they looked through the magnifying glass at the fine sand that they had brought up from the shore. Perfect little shells, no bigger than a pinhead! Tiny bits of sparkling crystal, that gleamed and shone like precious stones! Bits of shell of wonderful colors! Stones too small to be seen without the glass, each one a lovely bit of color! And all these wonders were contained in a spoonful of sand!

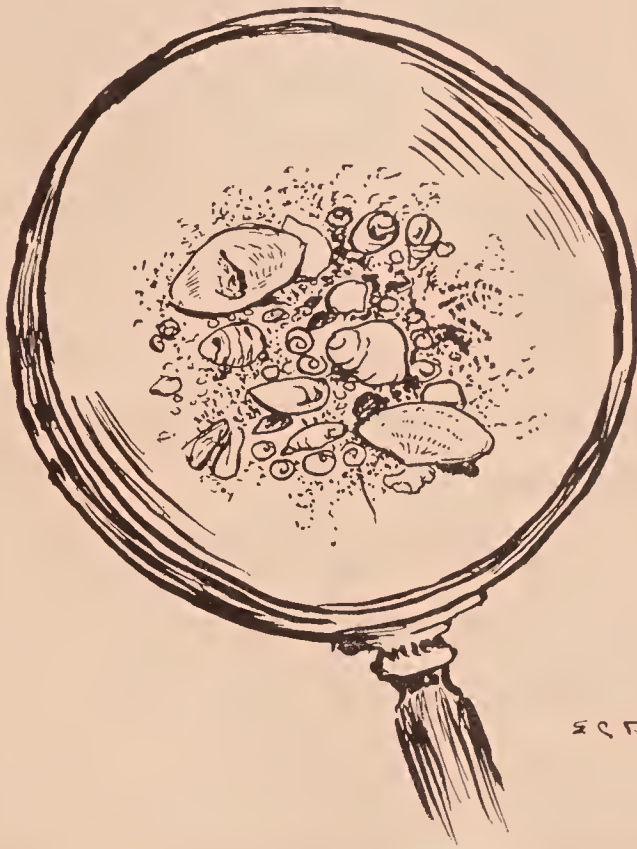
"Now let us sit down and rest for a while before luncheon," said their mother. "We will look at the sand again another day."



“Won’t you please tell us a story now?” asked Elinor.

“Oh, yes, a story, please!” said Philip.

“Very well, I will tell you a story in verse about the Little Green Pebble,” said their mother.



What Philip and Elinor saw through the magnifying glass.

## LITTLE GREEN PEBBLE

I'm a little green pebble  
With a white stripe around me ;  
So I'm called a lucky stone —  
Aren't you glad you found me ?  
How came I on the sand ?  
Of course I didn't grow there !  
I was part of that great cliff  
In the ocean below there.

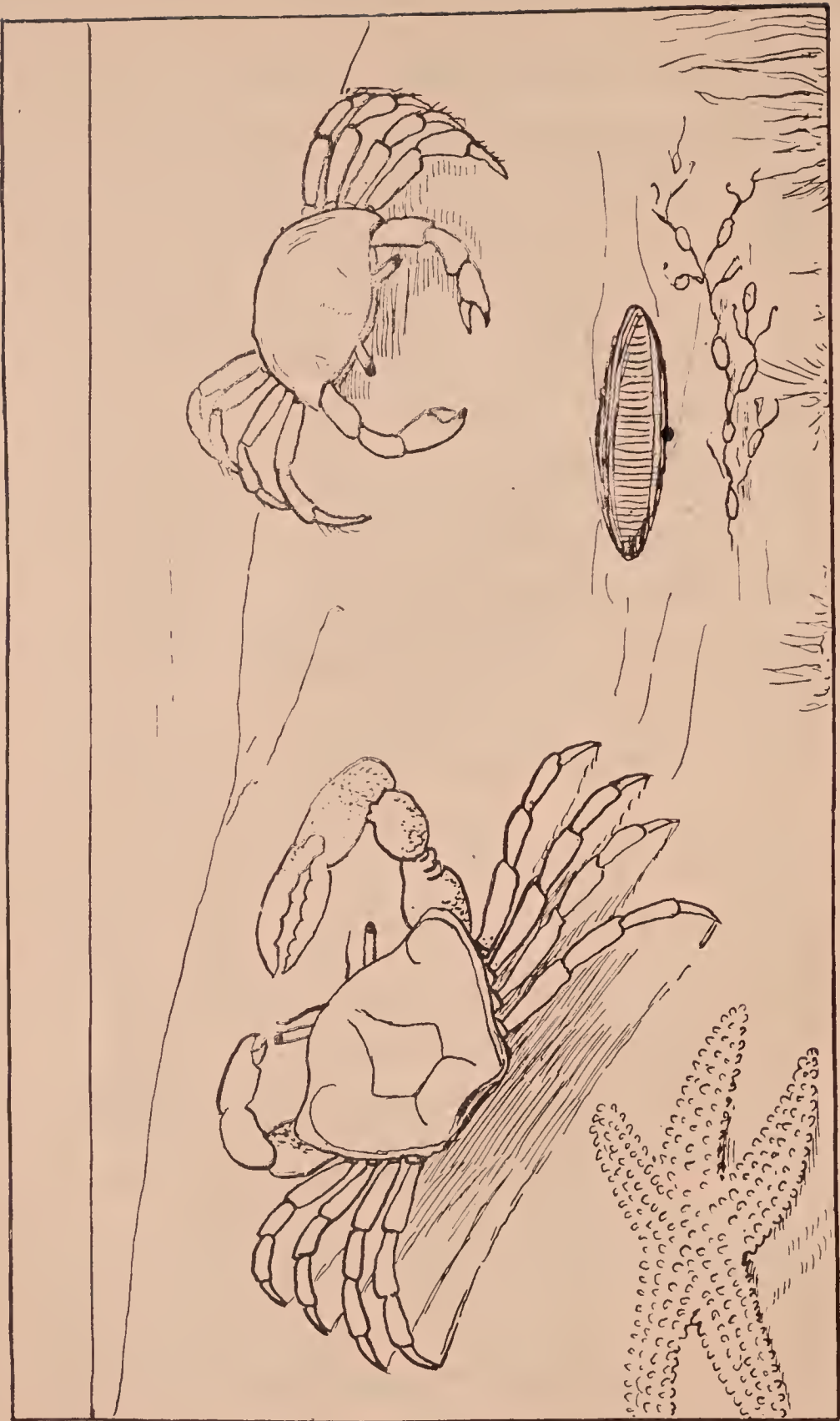
For years and years and years  
I faced the open sea.  
Then came a mighty storm ;  
The surf dashed over me ;  
The ocean leaped upon me !  
I felt a fearful shock !  
Up swept a mighty wave  
And tore me from the rock !

*Splash!* I dropped into the foam ;  
I spun round and round ;  
Up I leaped, then down I fell  
And settled on the ground,

With sea urchins and starfish  
And water weeds around me ;  
But I did not stay there long ;  
The tide came and found me.

Up it tossed me on the beach ;  
Backward it drew me ;  
Up again and down again  
On the sand it threw me.  
My sharp points and edges  
Were worn and ground away ;  
Rounder and smoother  
I found myself each day.

Then came the winter storms ;  
Farther I was thrown,  
Up where the sand is soft and fine —  
A shining, polished stone !  
Through sunny days and starry nights,  
With white sand around me,  
I lay and waited till you came —  
Oh, I'm so glad you found me !



Mr. and Mrs. Tealer Crab ready to dart into their hole if an enemy comes near.

## II. THE CRAB

“Oh, what a long, long beach!” said Philip the next morning as they stepped over the top of the sandy bluffs and looked down at the ocean.

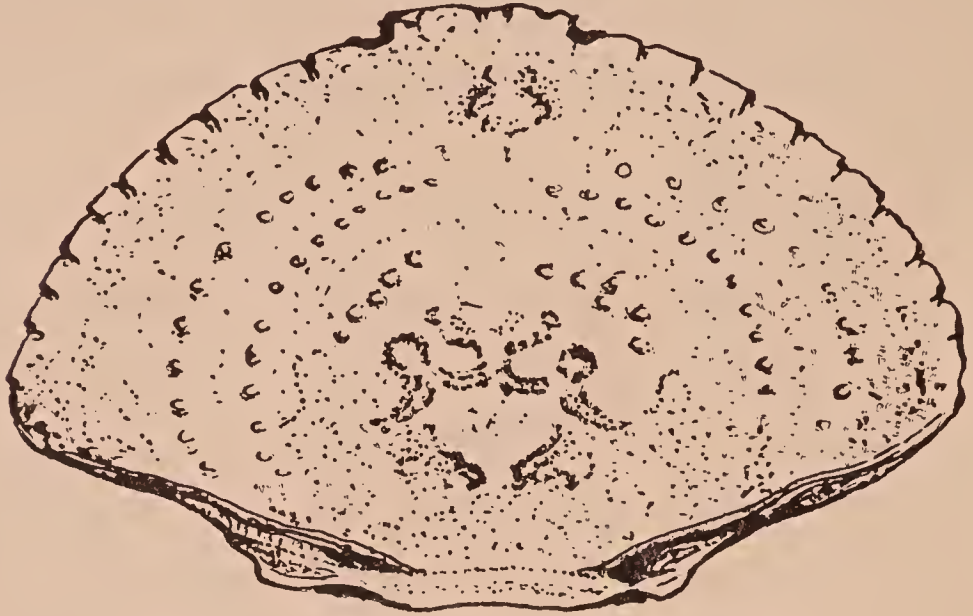
“The tide is going out,” said Mummy, looking at her watch. It is about the same time that we came yesterday, but the tide turns an hour later each day. So it will not start to come in until an hour later than it did yesterday. Funny, isn’t it? But it would take too long to tell you why. Look out for it when it turns, and don’t be taken by surprise when you find the waves coming up higher instead of going down lower. I am going to sit under the awning. When you see the big white rock down there standing wholly out of water you will know that it is ‘dead low tide,’ as the fishermen call it.”

“Let’s dig holes in the sand, and see if we can find some treasure hidden there,” said Philip.

“Yes, wouldn’t it be fun to find a box full of diamonds?” said Elinor.



So the two children went down as close to the water's edge as they could get and began to dig holes in the sand. Funny hopping beach



The top or back of an empty crab shell.

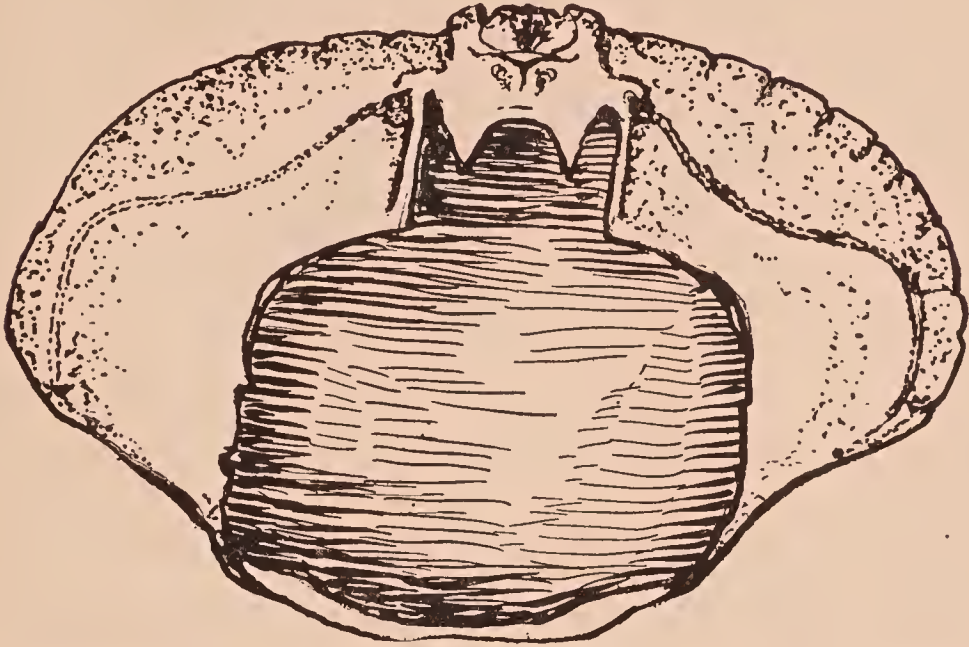
fleas jumped up into their faces. There were a great many flat speckled shells lying about. Some were quite large, others were small, only an inch or two long. Some were reddish, some brownish, some violet. There was a very pretty design on the back of these shells.

“Those are crab shells. Uncle John has some at home in his collection,” said Elinor.

“But there’s nothing inside,” said Philip, turning one over. The shells were empty.

“Perhaps if we look around we shall find some real live crabs,” said Elinor.

“I wish I could find one,” said Philip.



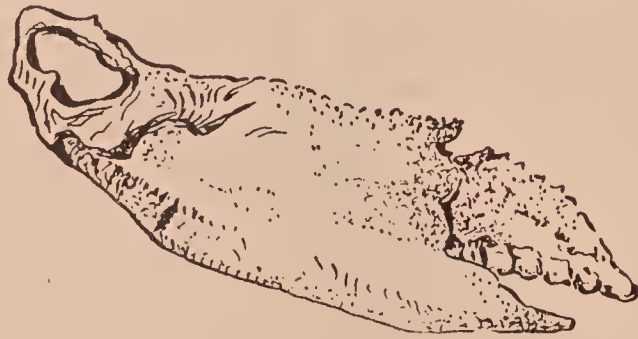
The under side of an empty crab shell; the dark spot or hole shows where the crab's body was.

He dug deeper and deeper. He shoveled the sand to right and left, furiously, stooping so low that Elinor could not see his head at all. All of a sudden he jumped up and cried “Oh!”

“What is it?” asked Elinor, looking around.

But Philip did not answer. He was stooping over, peering at something in the sand. Then he began to run, looking down at an object that was scurrying towards the water. When he had nearly reached the water's edge

he stooped down quickly and picked up something. It was a pretty little red crab, and he held it by one claw!



A crab's claw. The heavy toothed part can move like a thumb to help the crab catch its food.

“Ha! ha! I’ve got you!” he cried.

But Philip did not hold the crab very long, for it caught his finger in one of its claws and squeezed it so hard that he shook it off and stood holding his finger and screaming with pain. The crab went scuttling off and in a minute had disappeared into the sea.

“Oh! Oh! You naughty horrid thing! You’ve bitten my finger!” cried Philip.

Elinor looked at the finger. There was a tiny red mark where the crab’s nipper had pinched it.

“Come, we’ll show it to Mummy. It was a naughty, naughty crab to bite like that,” said

Elinor. "Don't cry. I guess your finger isn't hurt much."

"I wasn't crying!" said Philip, stoutly, wiping away a tear. "At least, not much. But it hurts awfully."

"Of course it hurts, dear," said Mummy, when she saw the finger with the red mark on it. "Crabs' claws can nip very hard. Come, we will cover up your finger in cool, wet sand. It will soon feel better."

So Philip put his finger down on the sand and they covered it all up.

"Now it feels better, doesn't it?" asked Mummy.

"Ye-es, a little. But it hurts some. What made the crab bite me, Mummy?"

"What did you do to him?"

"Why, I just picked him up."

"How did you lift him? By one of his claws?"

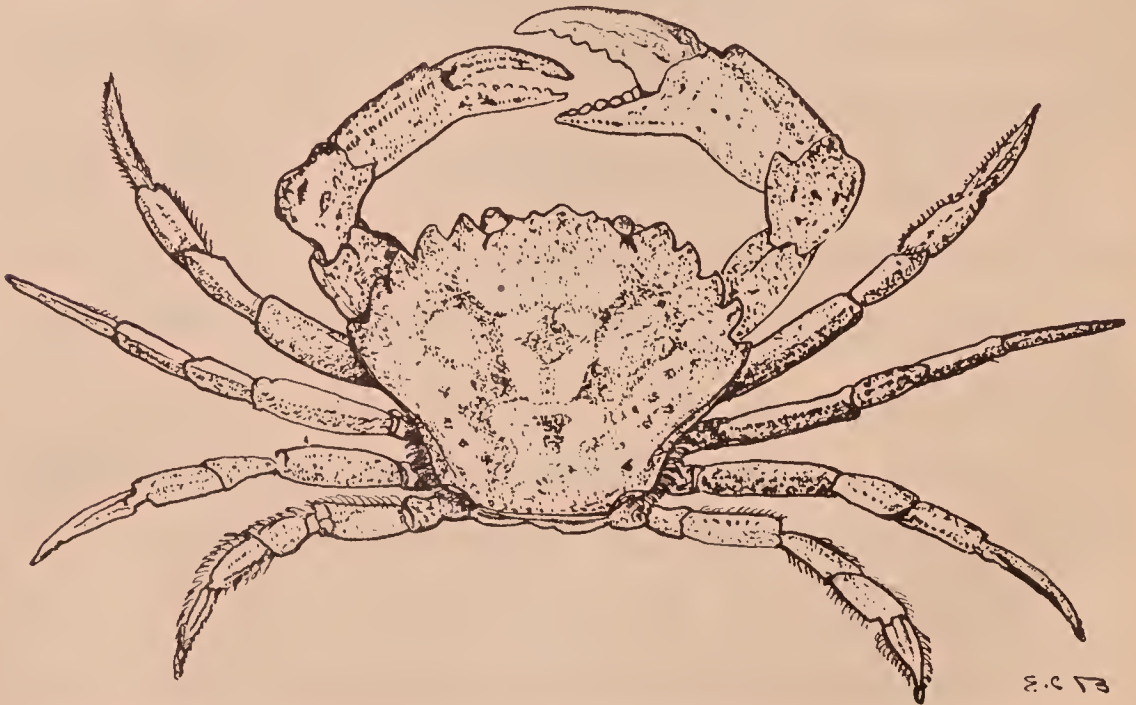
"Ye-es," answered Philip.

"Why, of course he nipped you, then. Poor little crab, he had to defend himself, didn't he? How would you like to have a big giant come and lift you off the ground by one finger?"

"Guess I wouldn't like it."



“If you had not taken him by surprise he would probably have snuggled down into the sand and hidden out of sight. Then he would have drawn his legs up under his shell and kept perfectly still. He is quite at home in the sand. Or, if he had a chance to run he would have scampered into the waves where you could not follow him.”



A green crab always has five teeth or points each side of its eyes.

“He was running into the water when I caught him,” said Philip.

Philip’s finger was better now, so they walked along the beach, picking up the crab shells that lay about.

“A crab shell is a very lovely thing,” said

Mummy. "See the little round places where the eyes come? Are they not well protected by the sharp points of the shell? It is jagged all around the edge you see. It is like a suit of armor. When the baby crab gets big enough to have a shell he is still very small. Shells do not grow as the little crabs grow, any more than your clothes grow when you do. So little Mr. Crab sheds his shell, just as you give away your old clothes. But he cannot get a new suit right away as you can. He has to hide away until a new shell grows."

"How funny!" cried Philip.

"At first the new shell is very soft, and is no protection at all. But it soon hardens. Then out comes Mr. Crab from his hiding place with a new suit of armor. By and by that suit, too, gets too small and he sheds it and waits for another to grow. But once he is full grown, he keeps his shell."

"I wish we could see another live one," said Elinor.

Philip hung back a little.

"Don't be afraid of getting nipped again, dear," said Mummy. "We will treat Mr.

Crab politely this time, won't we? We will not lift him up by one claw."

The tide was coming in very gently, lapping up the beach with hardly a ripple. The white rock was standing in water. The hole that Philip had dug was partly filled with water now. Here and there in the sand were funny little round holes, breathing holes for some little sea creature. Little bubbles of air rose as the waves retreated. Underneath the sand where each of those bubbles rose, was some living thing, a shell animal, perhaps.

"Every mark in the sand tells some kind of story, if we only knew what it was," said their mother.

Soon they came to a little groove of sand. Mummy poked it gently aside and out ran a crab. It was bigger than the one Philip had found. Mummy stooped and picked him up. But she held him by the shell, with one finger above and her thumb below. His feet waved to and fro, but he could not reach her finger with the pincers on his front legs.

"Good morning, Mr. Crab. We are not going to hurt you. We would like to look at you closely, if you don't mind."



“Oh, see his eyes!” cried Elinor.

“Why, they stick ’way out in front, don’t they?” asked Philip.

“Yes, they are on little stalks. That is so that he can see around him. He has ten legs,



A rock crab, the most common crab along our Atlantic coast.

you see. The first two are strong claws. The next two pairs are the ones that he uses most for walking. Now we will put him down and watch him run.”

Mr. Crab was only too glad to run. He did not care to be held up and looked at. It



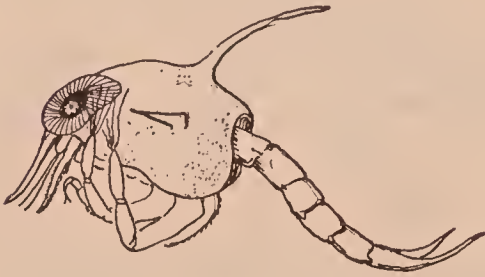
did not hurt any, but it had never happened to him before. Off he scampered towards the water as though an army of giants were after him.

“Why, he runs sideways!” cried Philip.

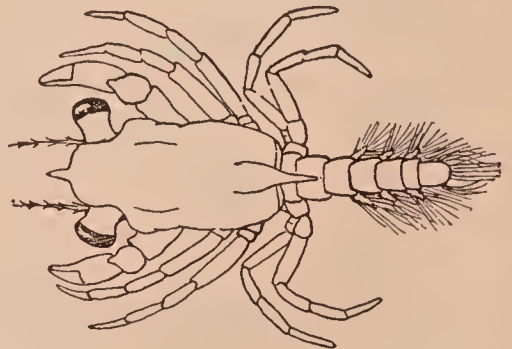
“Yes, he can run forwards or backwards, or almost any way that he chooses. Watch and see how some of his feet push the sand backwards, and some of them carry him forwards. He can run very fast.”

“He ought to run fast with all those legs,” said Philip.

“I would like to see a baby crab,” said Elinor.



This is a side view of a very young baby crab.



This crab is a little older; this top view shows both of his eyes.

“A baby crab is the oddest-looking little creature you ever saw. He has two enormous eyes and a long tail. He floats about for a little while; then he acts as though he were

flying all to pieces. He is really wriggling out of his shell. Then for a short time he looks quite like a different creature. Soon after, he swims or floats down to the bottom of the water and becomes a real crab. He is still very little. His shell has to harden before he can go about with any comfort or safety."

"Oh! The white rock is half under water!" cried Philip, suddenly.

"So it is," said their mother, looking at her watch. "Come, children, it is time to go. Say good-by to the ocean and to all the little crabs on the beach."

Then they all went up the plank walk, down the hill, through the Green Gate, along the garden walk, and into the big white house. Soon the children were in the cool, quiet nursery.

"Tell us a story, please, Mummy," said Elinor.

"What do you want to hear about this time?"

"Oh, about a crab," cried Philip.

So she told them the story of Mr. Crab.



This small crab, a Pinna crab, is sometimes called the oyster crab, because it often lives in oyster shells. It has no hard shell of its own.

## MR. CRAB

Oh, good morning ! Who are you ? My name is Mr. Crab.

Are you friend or are you foe ? My claws are made to grab.

I shall seize and pinch your finger if you try to push and poke me !

I can't stand any nonsense so you'd better not provoke me.

My home is in a rock pool. I can burrow in the sand.

I can paddle through the water or run upon the land.

Just watch me scamper sideways ! Look closely at my feet !

Some push me on ; some pull me ; don't you call that very neat ?

When I was young and little, — now what do you suppose ?

I outgrew all my shells, just as you outgrow your clothes !

I left the old one on the beach as soon as it  
got tight,  
And waited while another grew that fitted me  
just right.

I shed two coats one summer. But now I've  
reached full size,  
This handsome shell I'll keep. Don't you  
think that I am wise?  
Sometimes a claw gets broken off. It doesn't  
trouble me;  
I quickly grow another, just as easy as can be!

My shell's a suit of armor. It keeps me safe  
and sound.

The only way that you can safely take me from  
the ground

Is to put your thumb and finger, one above  
and one below,

And gently lift me up — that's right! Let go,  
now! Let me go!

Don't ever try to pull my claws! I really  
cannot say

That I might not lose my temper if you treated  
me that way!



Be sure to look me up again whenever you pass by.

Forgive my hasty words just now. Good-by, my friend ! Good-by !



Shells and starfishes on the rocks at low tide.

### III. THE STARFISH

For several days it rained hard — so hard that the children could not go to the beach. They played on the nursery floor with the shells that they had found. They played that the shells were different kinds of animals. Elinor had flocks of sheep and herds of cows. They were the little round white and brown shells that they had picked up. Philip had some

bigger ones which he said were wild beasts that came and tried to carry off Elinor's flocks. It was fun playing with the shells, but not so nice as being out of doors.

Then Mummy put the sand that they had brought home from the beach on a piece of paper and placed it under the glass that made things look big. What tiny, tiny shells there were! What glistening, lovely-colored bits of stone! Some of the little shells were so small that you could not know that they were shells at all without seeing them through the glass. They were such pretty colors, too — red and yellow and green and brown.

At last the sun came shining out brightly. Daddy came in at the same moment with a present for the children. And what do you think it was? A full-rigged ship! You may imagine how eager they were then to get down to the water and sail that boat.

“It is very wet after the rain,” said Mummy, doubtfully.

“The sea will not be much wetter, will it?” asked Daddy, slyly.

“No,” answered Mummy, laughing, “but

the grass will. There is not much grass to walk in, though. Well, children, you may put on your bathing suits, and then you will not be afraid of getting wet."

So Elinor put on her blue bathing suit, and Philip put on his red bathing suit, and they went down to Pebbly Beach to launch their ship. Elinor carried it under her arm.

"I am going out in the motor boat with Daddy and Uncle John and Auntie May. Nurse will go with you today. Be good children, and do just as she tells you," said Mummy, as she kissed them good-by.

How good it was to get down to the sea again! How the waves came dashing and roaring up the beach after the storm! Pebbly Beach was near the rocks. It was all full of pebbles, some quite large, but most of them small.

"We must be careful or the tide will carry our ship out to sea," said Elinor, looking doubtfully at the big waves.

"Come on, I'm holding the string so it can't get away," said Philip.

Then Elinor stepped right into the water where Philip was, and they launched the boat



on the waves. It bobbed about, then sailed rapidly away, bending so far down that the sail nearly touched the water. It was great fun.

Away out to sea they could see other sail boats, exactly like theirs except that they were bigger. There was a fine sailing breeze. They could hear the *chug! chug!* of Daddy's motor boat out there somewhere.

"I wish we could climb aboard our boat and sail out to meet them!" said Philip. "Wouldn't they be surprised?"

"I guess they would," answered Elinor. "Look out! She's going on a rock!"

Sure enough the boat had gone straight on to a rock and had to be lifted off, given a good shaking, and launched again. The little cove of Pebbly Beach was just the place to sail her.

There were all sorts of funny things lying about on the rocks and pebbles. Pretty bits of seaweed lay here and there. Some of them looked like little ferns, with delicate branches. Some of the seaweed looked like green grass, some like leaves, and some was snowy white.

“Let’s tie the boat to a rock and look around on the beach,” said Elinor. “I want to carry home some of this lovely seaweed to show Mummy.”

So they tied the boat to a rock. Elinor picked up the prettiest pieces of seaweed that she could find and put them carefully into her pail. Mr. Crab poked his nose (if you could call it a nose) out at them from behind a rock. But he evidently knew them for an old friend, for he did not seem a bit afraid.

“Perhaps Mr. Crab has told all his aunts and brothers and cousins about us,” said Elinor.

“And so they know we are friends of theirs,” said Philip.

There were lovely stones of wonderful colors all about. There was seaweed growing on the rocks, with funny little brown balloons on it that floated on the water and held up the seaweed.

Suddenly Philip cried out, “Oh! I’ve found a star!”

Elinor ran to see the star. It was the prettiest little red one that you ever saw. It lay on a rock near the water.

“Is it really a star? Could it have fallen down?” asked Philip.

“No, of course not. Not really a star out of the sky. I wonder if it is alive.”



A starfish which is growing a new arm. The little white spot near the middle of the starfish is a water sieve which strains all the water as it goes to the tube feet.

Philip touched it with his finger. It moved just a little, but seemed quite content to lie where it was.



“Oh, here’s another one! But this one is bigger, and it is bluer than that one!” cried Philip, with his head behind a rock.



The under side of a starfish, showing the tube feet all along the middle of each arm.

“And here’s another, and another! Oh, there are lots of them in the pools!” cried Elinor.

Sure enough, there were dozens of them,



spread out on the rocks in the sun; or lying in the pools that the tide had left. They were in such funny positions — not at all comfortable, the children thought.

As the cold water came flowing into the pools with the rising tide there was a slight movement among the starfishes. One moved his arms ever so little. Then he began to stretch them out. Then he slowly, without any effort it seemed, moved forward in the water and glided to a new position. It was such fun to watch them! All of them had five pointed arms, like stars with five points. Their backs were covered with small bristly points. Underneath they were light, almost white, with little pointed humps running in two lines down their arms. At least, that is the way the children described them.

“See this cunning little baby one! He is moving!” cried Philip.

The little starfish put two feet forward slowly, then pushed himself along gently with the three others. In this way he came to the edge of a pool. He moved slowly along, then dropped down to a remote corner, where he clung so

tightly to the rock that Philip and Elinor could not pull him off, though they tried to do so, without hurting him. How could such a little creature hold so firmly?

*Chug! chug! chug!* came the sound of a motor boat quite near shore.

“Why, that must be Daddy and Mummy and Uncle John and Auntie May in the motor boat!” cried Elinor, running up to the top of a rock to see.

“Hello! Hello!” called a voice from the boat.

The children waved their hands and called back.

“Come, children,” said Nurse, who suddenly appeared from a warm corner where she had been sitting near by. “Your father and mother have come back. It is time to go home. But where is your boat?”

The boat! Where was the boat, indeed? The children stood staring at the rock to which they had tied it. Water covered the rock!

“Oh, dear! Oh, dear! She’s lost!” cried Elinor, bursting into tears.

“Our boat! And we wanted to sa-sail out to meet them!” cried Philip.

“What is the matter?” called a voice from

the motor boat. "What are you children crying about?"

"We've lo-ost our bo-boat!" cried Elinor.

"No, you haven't! Cheer up, kiddies!" called Uncle John.

"Poor little dears! She's safe! Don't worry!" came Auntie May's voice.

"We caught her!" cried Mummy's voice.

"Here is the boat!" cried Daddy's voice.

Daddy was holding something up to show them. It was the boat, safe and sound. It had done just what Philip wanted it to do. It had sailed out to meet the motor boat.

Then Elinor and Philip laughed, and clapped their hands. They were so glad to have their boat safe, after all.

"But I wish we'd been in it," sighed Philip.

All together they went up the plank walk, down the hill, through the Green Gate, along the garden walk, and into the big white house.

Everyone laughed and talked and told over again the story of how the boat came sailing out to meet Daddy and Mummy and Uncle John and Auntie May. And Elinor and Philip hugged the boat, they were so glad to see it

again. Then they took their treasures out of their pails and showed them to their mother. Elinor's mosses were in a great bunch, all covered with sand.

"Oh, my pretty seaweed!" she cried, in dismay. "It looked so pretty when I got it, but it is all mixed up with sand now."

"Never mind, dear. Let us put it in a dish of water," said Mummy.

So they put it in a dish of water, and it floated out, as pretty as ever.

Then Philip showed Mummy a starfish that he had found, all dried up, on the beach. It had a thick, tough skin, with small prickles on it.

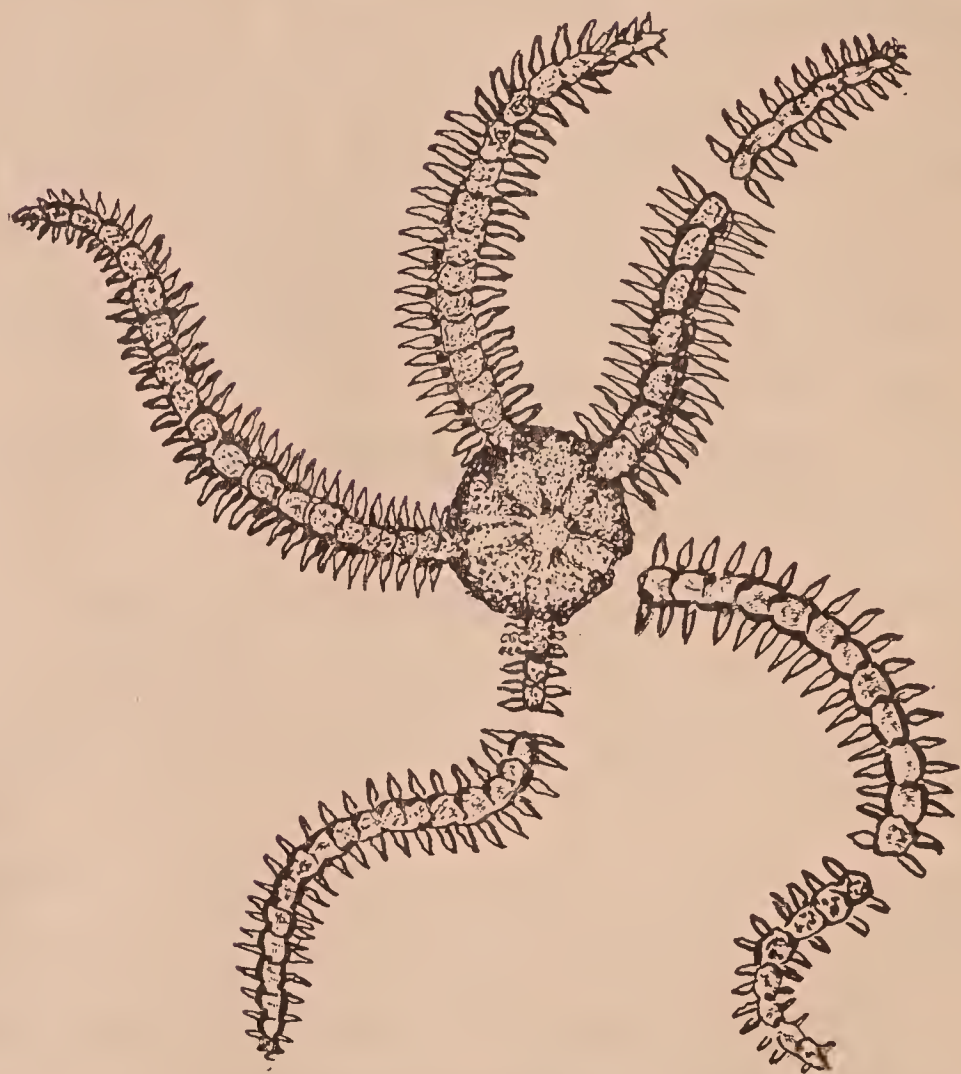
"Oh, a starfish!" exclaimed Mummy. "What a pretty one! See, it has five arms, like rays, coming from a center in different directions. It is sometimes called a radiate — and that name describes its pattern very well."

"Is starfish really its name?" asked Philip.

"Yes, you see, it looks like a star, doesn't it? Now, what do you think? If one of these arms gets broken off, a new one grows out! Do you see that one of the arms of this starfish is shorter



than the others? That is a new arm that is growing in place of one that got broken off.



A brittle star with broken arms. These starfishes are shy and hard to find, as they like deep water. When alarmed, they throw off pieces of their arms.

“Sometimes the little starfish gets broken quite badly, and loses several arms. But they all grow again. There is one kind of starfish called a ‘brittle star’ that can drop his arms

off if anything has hold of them. Then he swims away and grows new ones."

"Think of that!" said Elinor.

"Think of what a tiny living creature like this can do to save itself. Look at his back now, through the glass. There are several different kinds of spines. On the end of each arm is an eye! Such a tiny red one! And there is also a tube foot that seems to smell and to feel. The mouth is in the center, underneath. The starfish is very fond of oysters. It seems odd to think of a starfish eating oysters, doesn't it? Some of the starfish's tiny spines seem to act as comb and brush and keep the little creature clean. The others help him to move about. The little tube feet can attach themselves to a rock and hold on so tightly that you cannot draw the starfish away. Moving out and in the tube feet help him to glide along. Aren't they wonderful little creatures?"

That night, before Elinor and Philip went to sleep, they asked for a story-poem.

"About a starfish, Mummy!" they cried.

So she told them the poem about the Starfish.

## STARFISH

Little Asteria,  
Five-pointed star,  
Could you have fallen from  
Heaven so far?

Long time the waters deep  
Hid you from sight ;  
Now the out-flowing tide  
Brings you to light.

Thousands of starfishes  
Crimson and blue,  
Orange and violet,  
Lie here with you.

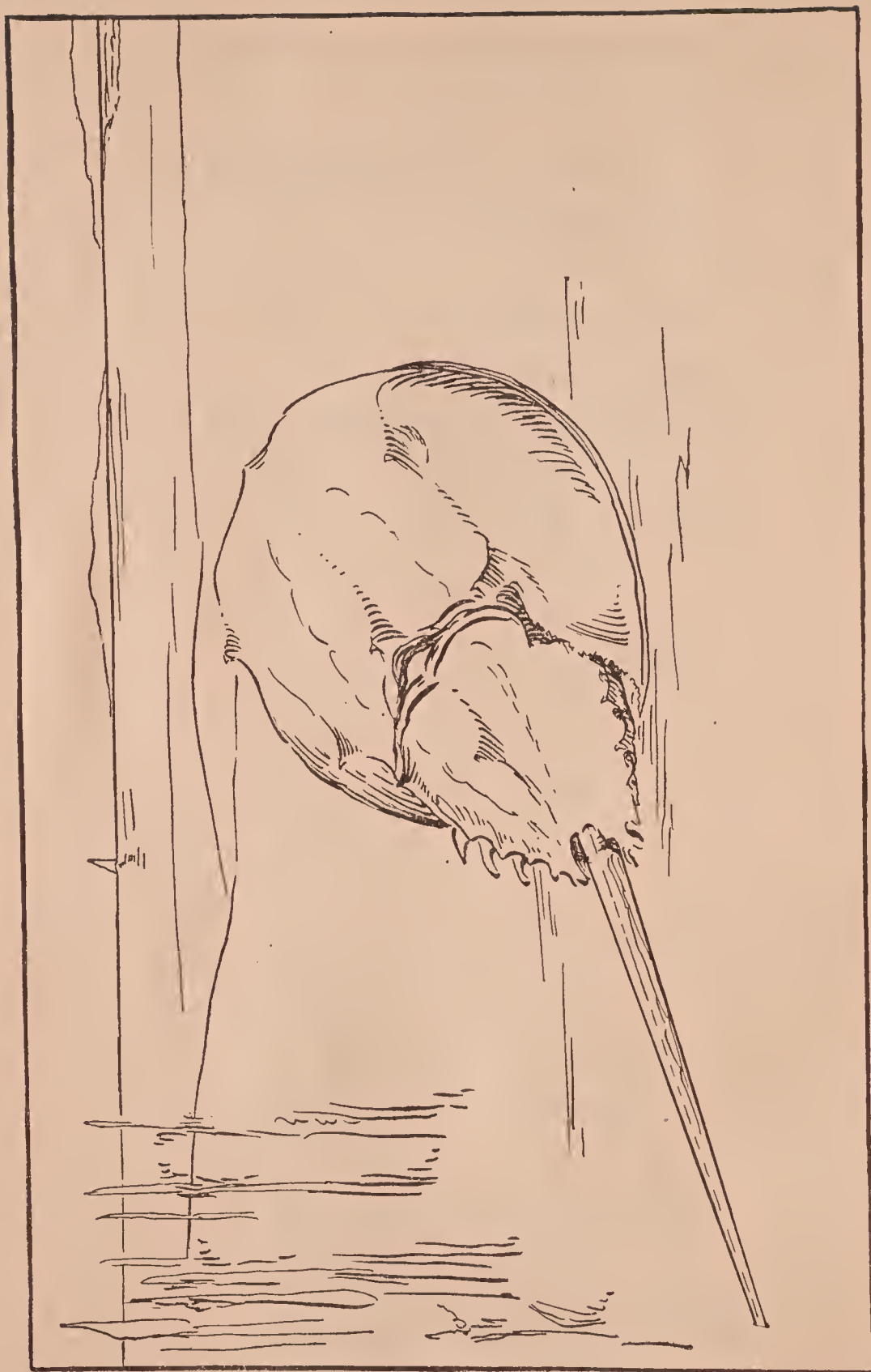
Stretched on the slippery sands,  
Warm in the sun,  
Living and breathing  
Like you, every one.

See, she is moving now ;  
Two pointed toes  
Forward, the other three  
Drag as she goes.

Now she has found a bed ;  
Settled to stay ;  
Clinging so fast you can't  
Pull her away.

Little Asteria,  
Shine where you are,  
Up toward the skies above,  
Pretty Sea Star !





A horseshoe crab, showing its big round shell and its long stiff tail. Real crabs have no tails.

#### IV. THE HORSESHOE CRAB

Elinor was having a wonderful time arranging the seaweed that she had found on the beach. Mummy had placed a dish of clear water on the table beside the dish in which the seaweeds floated. Then she had cut some squares and oblongs of white paper and laid them in a pile beside the dish of water. Then she found two large pins. One she gave to Elinor, and the other she took herself.

“I will mount the first piece of seaweed, and you may watch me and see just how it is done. You may do the second piece.”

She separated a small piece of seaweed from the others and put it in the dish of clear water, where it floated around and spread out its branches. It began to look like itself now that it had plenty of room to be seen. Mummy gave it a gentle touch now and then until it was spread out so that all its branches showed. Then she quickly slipped one of the pieces of paper underneath it. It clung, dripping, to the paper as

she lifted it out of the water. She laid it on the table and, taking her pin, began to separate the branches on the paper, until



A very fine, delicate seaweed mounted on paper.

the seaweed lay flat just as it had done on the water. She worked very deftly. Each tiny branch was touched lightly, and moved ever so little until it lay in its proper place.



“Oh, how pretty! How pretty!” exclaimed Elinor. “But what makes it stick to the paper? Won’t it fall right off?”

“No, there is a good deal of sticky stuff in seaweed. It will not fall off, even after it is dry. I have some that I have kept for years. It is just as pretty as when I mounted it. Now, would you like to try one?”

“Oh, yes. But I’m afraid I shall spoil it,” said Elinor.

“You may have to try for a while before you can make a good one. It takes patience, and you must work carefully and gently. The little branches are fragile and will break easily if you are not careful. But you will get the knack of it after a while. Here is a pretty little piece. Try this.”

At first the seaweed floated in every direction but the right one. The paper bent and wrinkled. It was a fussy job, and Elinor was almost in tears. But a touch here and there from Mummy’s deft fingers set things straight. Before long things went better. It was great fun to see the tiny branches spread out into a lovely tree-shaped design. Elinor was very proud of



her first successful attempt, which was with a piece of delicate red seaweed. When it was mounted Elinor clapped her hands and shrieked with delight.



This is the seaweed that Elinor mounted.

“Next winter you will be glad that you made these,” said her mother. “They will make very nice cards to give away to your friends.”

“Oh, I love to do it! I am glad I got so many of them. And — just think! — I did not

know what I was going to do with them when I brought them home !”

So Elinor worked away. Each piece she made was prettier than the last. No two of them were in the least alike.

In the meantime Philip had grown tired of watching them. He had tried to mount a piece of seaweed that his mother gave him, but his fingers seemed to be all thumbs. The paper tore, the branches got tangled and broke all to pieces. He threw it aside in disgust and went to the window. It was raining hard. He went to the nursery. Nurse had been given a morning off, and he was quite by himself. His wooden horse stood in the corner looking lonesome, too.

Suddenly a ray of sunshine came peeping out of a cloud, smiled at him, and decided to keep on shining. It was clearing off! What a shame to stay indoors when the sun was shining! His horse needed exercise, too. Why not take him to walk in the garden?

In five minutes more Philip had stolen softly out of doors, and, holding his horse by the bridle, was walking down the path towards

the Green Gate. And when he reached the Gate he found that someone had left it open!

Now Philip had not thought of going through the Gate, but when he found it open his horse reared and plunged and galloped right through the open Gate, up the hill, down the plank walk, and straight out to the beach! Down they galloped until they came to the very edge of the water.

There was no time to take off shoes and stockings. Philip's white boots sank into the soft, wet sand. But the horse was on wheels and did not seem to mind it at all. He reared and pranced about. It was all Philip could do to hold him in.

An idea came to Philip. Why not give the horse a bath? He needed it badly. Here was a fine chance. A wave came dancing up, but ran back before he could lead the horse in. Besides, it was rather scary going near those big, curling waves. Up came another. This time, holding fast to the horse's bridle, Philip plunged him straight at the roaring wave.

Now the horse did not like this at all. The water was very cold. He was not used to salt



water baths, or any other kind, for that matter. A long piece of seaweed got caught in one of his legs. Philip stumbled over this, and, before he could get to his feet, the next wave sent them both sprawling, drenched from head to foot with icy water.

With a great effort the horse and his master got to their feet and went back, away from the waves. They shook themselves and the water dripped from the horse's mane and tail, and from Philip's hair and from his white suit.

Just at that moment Philip spied something on the sand that was different from anything he had seen before. It was more like a crab than anything, but it was larger, and was shaped something like a horseshoe. It had a tail, and was covered with a shell of a brownish color. It was not alive, but had lain on the beach for some time in the sun, and was quite dry, except where the wet sand had clung to it.

What could it be?

Philip examined it cautiously. He did not want to be nipped again, and this creature had long legs; not so long as a crab's, but with nippers on the ends. He could see them when



he turned it over. It did not move. Then he lifted it by its sharp, pointed tail and looked at it. On its under side its legs were curled up. There were five legs on each side. Yes, it was something like a crab, but how different! He decided to take it home and show it to Mummy.

The sea gulls were flying overhead with shrill cries. Away out in the water a flock of them was following a fisherman's boat, ready to pounce on any scrap of food that he threw overboard. How pretty the little boat looked in the bright sunshine with the gray and white birds surrounding it! There was not a person on the beach. It seemed a little lonesome. Philip had been so eager to take his horse down to the water that he had not thought of that before. He began to feel cold and wet. The water was running around inside his boots in a horrid way. He was dripping all over. And — what had happened to his horse? The color was all coming off in streaks and spots. Salt water is not good for a horse's complexion; that is, if he is made of painted wood.

So Philip decided to go back. Up he went, dragging the horse through the soft, deep sand,

which stuck to his boots and stockings. The horse kept stumbling and falling, and was soon a mass of sand, and so heavy that his master could hardly drag him. Once the weight pulled him over, and they both fell heavily down. Philip bumped his head on a rock and the sand went down the back of his neck and into his nose and eyes. It was a sorry-looking pair that stumbled up the plank walk, down the hill, through the Green Gate, along the garden walk, and into the big white house.

But, held fast in Philip's fist, was the funny thing that he had found on the beach!

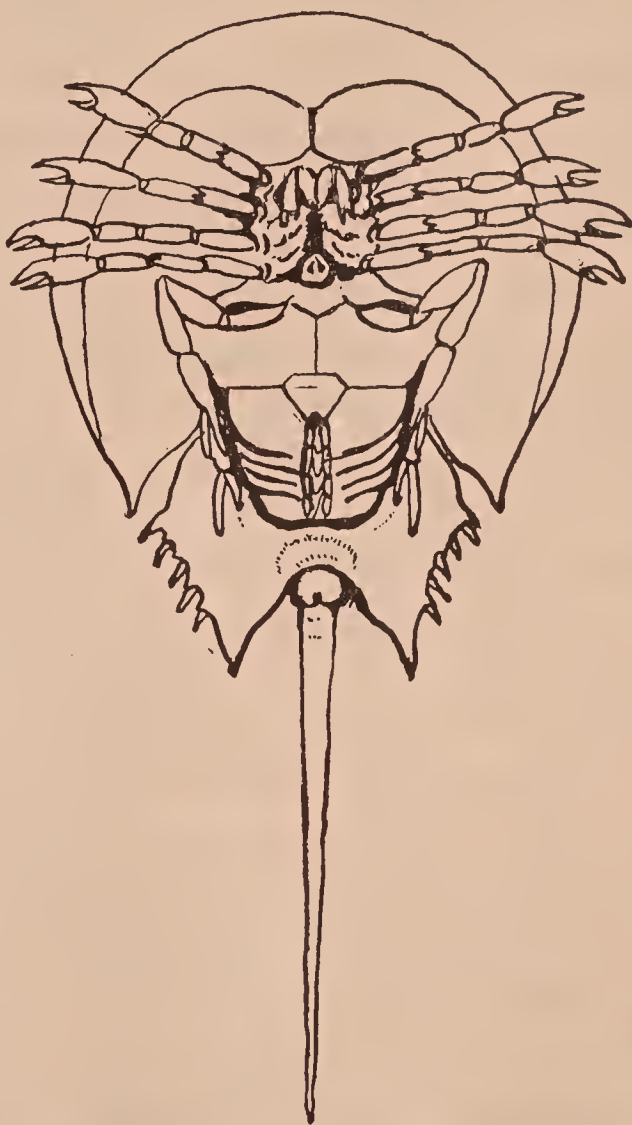
What a commotion there was when the two appeared at the door! Everyone had been looking for them ever since Nurse came home and found that Philip was not in the nursery. No one had thought that they would go out into the garden, and through the Green Gate to the beach.

"Why, Philip! My dear child! Where have you been?"

"Oh, he's all covered with sand! And look at his horse! The color is all coming off in streaks!"

“Look at your white suit! And at your boots! Why, you are soaked through, child! Come, and I will put you right to bed.”

“Wait, Mummy,” said Philip.



The under side of a horseshoe crab, showing its legs and mouth.

He held out his treasure.

“See what I found on the beach!” he cried.

“Well, you have found a horseshoe crab.

There are not many of them on our beach. That is quite a good find, dear. It looks like a horseshoe, you see. The horseshoe crab is not a crab, really, though it looks like one. It lives on the sandy shore, and burrows underneath the sand with its rounded head. It has two pairs of eyes. The first pair you see here, in front. They are well protected with a thick, hard skin. The second pair are very tiny. They are in the center of the shell. He is an odd-looking thing, isn't he? Well, dear, you have a new thing to add to your collection, haven't you? But you shouldn't have gone to the beach alone. You knew that, didn't you?"

"Yes, Mummy. I won't go again. But — well, it cleared off. And I was lonesome, and the horse needed a bath. But I didn't mean to go to the beach until I found the Green Gate open. Then I just thought I had to go."

"I guess your horse is sorry that he went," said Mummy. "He will never be so good-looking as he was before he took a bath. And your suit! And your shoes! But I am glad that you came back safe and sound. And you will never, never do such a thing again."



When Philip was warm and dry, he and Elinor went out on the piazza and asked their mother to tell them a story.

“Well,” said Mummy, “I will tell you the story-poem of the Horseshoe Crab, which is not a crab, really, and of others which are real crabs.”



These sea snails are sometimes called periwinkles.

## THE HORSESHOE CRAB

Good day, my friends! My name, you ask?

Well, I am what you call

A Horseshoe Crab; but wise men say I'm not  
a crab at all.

I'm something like a horseshoe with a funny,  
pointed tail,

All covered over with a shell, just like a coat  
of mail.

I've six or seven pairs of legs that walk along  
the land,

And others that I swim with. I can bore into  
the sand;

My rounded head I push and push until I've  
made a hole,

And there I am all covered up, as cosy as a mole.

There are many kinds of real crabs living every-  
where.

A great big splendid family: and some are  
very rare.

There's dear little Lady Crab, no bigger than  
your hand;

Her shell is white with purple rings; she burrows in the sand.

There's Green Swimming Crab; he's a wild, reckless fellow;

His forelegs are like paddles; he is spotted with bright yellow.

And Fiddler Crab whose claws are like a fiddle and a bow;

He makes a deep hole in the sand to hide him from his foe.

He scrapes up little bits of sand and forms them into balls,

And brings them back beneath his feet, then builds them into walls;

And so he makes a lookout-house above his hole, outside,

Where he stands on tip-toe watching, or can scuttle in to hide.

There's clever Spider Crab, too. When he wants to hide away,

He puts a bunch of seaweed on his back, and there 'twill stay;

It grows tall and long and branching; if you searched with all your might

You would not know a little crab was hidden  
out of sight.

Chillippa, the Box Crab, can fold her legs up  
tight.

You'd never guess she was a crab; she's quite  
concealed from sight;

Safe cuddled in her box of shells, she closes up  
her door,

And bobbing lightly on the waves, is carried  
to the shore.

And tiny Pinna Crab, so pink and soft and  
small;

He lives within an oyster shell. He's smallest  
of them all.

There's more that I could tell you, but I really  
mustn't stay;

Good-by, my friends! I'll leave the rest until  
another day!





Seaweed and starfishes on the rocks at low tide. Some of the starfishes are very limp, and may soon drop into the water.

## V. THE SEA URCHIN

“What do you suppose we’ll find today?” asked Philip, as he and Elinor scampered down the garden walk towards the Green Gate.

“Oh, I wonder what it will be!” answered

Elinor. "We always find something new, don't we?"

"Yes, perhaps it'll be a big sea serpent, like the one Uncle John was telling us about yesterday," said Philip.

"Or a whale or a shark or something like that," added Elinor.

"I'd like to find a whale," said Philip. "Wouldn't it be fun to show it to Mummy and Daddy and Uncle John and Auntie May?"

"Dear me!" cried Auntie May, who went with the children that morning instead of their mother. "What do you think you would do if you saw a big whale coming towards shore?"

"I'd go and catch it!" cried Philip stoutly.

Auntie May laughed.

"Do you know how big a whale is?" she asked. "Why it would be as big as from here to those cliffs over by Pebbly Beach. In the first place it would not be able to get very near the land, because it is so big that it has to swim in deep water, just as big boats need deeper water to sail in than small ones do. As for catching it, Philip! Why, you would run and hide."

“I don’t think I’d be afraid,” said Philip.

“It would be nice to add a whale to our collection,” said Elinor. “But there wouldn’t be room for him. We should have to find a new place to keep our collection then.”



An empty sea snail shell worn and broken by the waves.

“Just think of the things that we have already,” said Philip. “A piece of green stone, — jasper — and some red jasper, and some crabs —”

“And a starfish —” added Elinor.

“And a horseshoe crab —” said Philip.

“And some mounted seaweeds —” said Elinor.

“And shells and sand, and lots of other things,” said Philip.



“There must have been a storm at sea,” said Auntie May. “See all the driftwood lying on the beach. And what a lot of kelp has been torn up by the roots and thrown ashore!”

“What is kelp?” asked Philip.

“Kelp is the long seaweed that grows in deep water, with its roots on the bottom of the ocean. See, there is a lot of it here.”

Philip seized a long piece and dragged it after him by the hollow stem, which was as big around as two of his fingers. The end was leaf-shaped and about two feet long.

There were all kinds of things thrown up by the waves; pieces of broken spars, lobster buoys that had been separated from the ropes that tied them, planks, pieces of cork floats, bits of tarred rope and driftwood; all scattered from one end of the beach to the other.

The children ran about gathering heaps of curious things and piling them up.

“We might build a fire of driftwood,” said Auntie May. “There is plenty of wood to burn, but I have no matches. Besides, the wind is blowing toward the land. It would not be safe.”



“Why not? Oh, can’t we build a fire?” cried the children.

“We must wait until another day for that. We cannot take risks with fires. Run and play a while, dears, and I will sit down in the shade.”

The tide was very low. The big white rock was standing out of water. Elinor ran and stood upon it. It was fun to watch the tide come stealing gently back, pretending not to come after them, but slowly and surely making its way up the beach again. Before they knew it the big stone was standing in water. A mist came creeping over the ocean. First the horizon line, where the water seemed to end, was hidden. Then they could no longer see the islands out to sea. Then the great cliff to the right of them was hidden in a thin veil of fog. The air felt cooler.

“Let’s each dig a well and see which one can dig the deeper one,” said Elinor.

“Yes, and see which well will get filled up with water first,” added Philip.

So they ran up the beach and began to dig as fast as they could. Down, down, deeper and deeper went their shovels. By and by they

used their arms and hands, scooping up great lumps of dripping sand and heaping it on each side of their wells. The tide came creeping up gently, but the wells were not filled yet.

"You can't catch us, Old Ocean!" cried Philip.

But he looked up a little fearfully. It was a bit scary to see it creeping so near.

"Let's see how long we can stay," said Elinor.

"Yes," said Philip.

*Lap! lap! swish!* came a sound behind him. The water was creeping up.

"I'll stay as long as you do," said Elinor.

"All r-right," said Philip.

*Swish! swish-sh!* came a wave and filled the wells to the brim!

Elinor jumped up and looked around. Then she gave a little cry.

"Oh! What is it?" cried Philip, jumping up and looking around, too.

The two children were on a little rise of sand that was quite a bit higher than the beach around them. The tide had come softly around this mound, and there they were on an island, with rippling water all about where they stood!

The fog was thick now, and they could hardly see in what direction they were looking. The fog covered the ocean like a thick, soft blanket of white wool.

The two children screamed aloud at the top of their voices. "Oh, Auntie May! Auntie Ma-ay! Oh, Mummy! Mummy!"

"Here I am, dears! Oh, where are you?" came a voice from out of the fog.

"Here! Here! Oh, hurry!"

The children could not say where they were because they did not really know.

"I'm coming! Oh! Why, you are all surrounded!" cried Auntie May.

They could see her now, standing quite near, beyond the rippling waves.

With one bound the children dashed toward her. But the water splashed about as they jumped into it. In they went up to their knees.

"Wait a minute! I'm coming!" cried Auntie May.

She waded in from her side, made her way across, seized a hand of each of the children, and in two minutes more all three stood on dry land.

“Well! well! well! That was a close shave,” said Auntie May. “How did you come to stay so long in that place when the tide was coming in?”

“We wanted to see how long we could stay,” said Philip.

“And the fog was so thick that we didn’t see that the water was coming all around us,” said Elinor.

“These fogs come in so quickly,” said Auntie May, “that the fishermen are more afraid of them than of storms, even. Without a compass, how could a man in a boat find his way? Just think! I fell asleep on the rock and did not wake up until I heard you calling me!”

“It was a narrow escape, wasn’t it, Auntie May?” asked Elinor.

“It was a very narrow escape. Why, the water has covered the place where you were by this time. Don’t ever take risks with the tide. It will get the best of you if you don’t look out. How could I have fallen asleep!”

“What is a compass, Auntie May?” asked Philip.



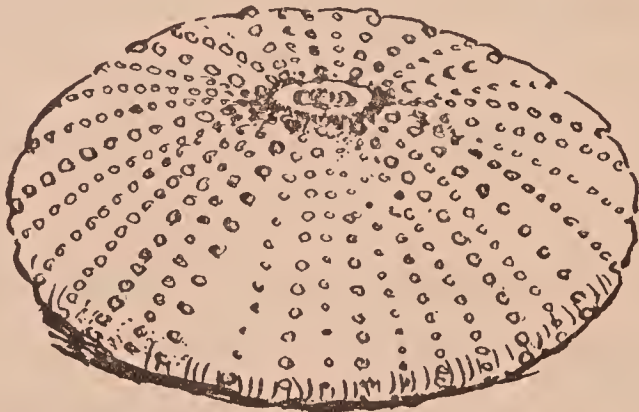
“Oh, a compass is a little instrument that points to the north. If a sailor knows which direction is north he can usually find his way home,” said Auntie May. “That is, unless the wind blows him out to sea, or the waves carry him on to the rocks. He has to keep a sharp lookout for winds and tides.”

“We didn’t find any whales!” said Philip.

“Nor any sea serpents,” said Elinor.

“Aren’t we going to find something?” asked Philip, disappointedly.

“Hello! Here’s something!” cried Elinor.



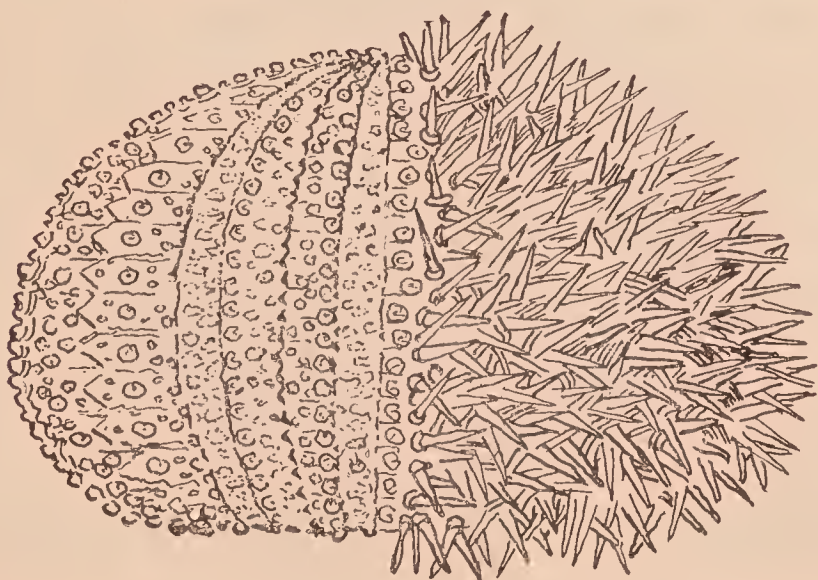
Dead sea urchin shell, with all the spines broken off. This shell is an old worn shell and does not show the pretty pattern as well as the next two pictures do.

She picked up a round greenish object that looked a little like a shell. It had small lumps on it running up and down in lines. There was a round hole on the under side.

“That is a sea urchin,” said Auntie May. “It is first cousin to the starfish. It is a radiate. That is, it has rays coming from a center. Suppose you took a starfish and bent up its arms and fastened them together at the top so as to form a ball, it would look something like a sea urchin, would it not?”

“Why, so it would,” said Elinor, looking at it closely.

“It has tiny knobs all over it,” said Philip.



A sea urchin with some of the spines broken off, and showing where they were fastened to the shell.

“That is where the spines grow. When sea urchins are alive they are all covered with spines. This is an empty shell, you see. Oh, Philip has found one with spines on it!”

Philip had picked up another empty shell,

but this one was covered with short, bristly brown spines that pointed in every direction.

“His spines are a very good protection. See how sharp they are. They help him to walk along the ground. He can go in any direction. There are three kinds. The long ones stick into anything that tries to hurt him. The smaller ones act as little brushes and combs, and keep him clean. Others open and shut their forks, which are almost too small to be seen, and reach all about. They can untangle and throw aside any bits of seaweed that get caught on his body. Sometimes they reach up and around and pick up bits of seaweed, which they place on him as if to hide him from sight. The third set of spines helps him to see and to hear; or, at least, to know what is going on around him. He has specks of eyes, too.”

“What is this hole? Is it his mouth?” asked Philip, turning the sea urchin over.

“Yes, that is his mouth. The live sea urchin has five long teeth which project over the mouth. There are ten little feelers around it. And its tube feet are the most wonderful things! There



are a great many of them. They can extend far out beyond the ends of the spines. They enable him to cling tightly, just as the starfishes do, and with them he can creep or roll his body over. They are lazy fellows, these sea urchins. They are not so fond of moving about as their cousins, the starfishes, and are content to live idly in one spot, covered with seaweeds or stones. They grind out holes in



A sea urchin with part of the spines broken off. Notice the tube feet which can reach out past the spines.

the rock with those little teeth of theirs, and stay in the hole, quite safe. Often they grow bigger than the hole entrance and cannot get out. But they do not much care. They are



happy and contented. Sea urchins are vegetarians; that is, they prefer vegetable food."

"How can they bite the hard rock, I wonder, with those little teeth?" asked Elinor, looking closely at the one with spines that showed the teeth on the under side.



A sea urchin shell broken so as to show the bony part in the middle.  
This bony part can be more easily seen in the next picture.

"They turn round and round until they have ground away an opening. Isn't it wonderful to think of? Some sea urchins are green, some are almost black in color."

"And just think! We've got another specimen for our collection," said Philip.

"We'll take it home to show to Mummy. There are two specimens, really, aren't there? One with spines, and a dead one without spines!" said Elinor.

“It is high time to be going,” said Auntie May. “My shoes are full of salt water. You do not mind if your feet are wet, for you have no shoes or stockings on. But I waded in after you, remember. Come, children !”



This is Aristotle's lantern, the bony part inside of a sea urchin. The five pointed teeth are at the bottom ; four of them show here.

The fog was getting so thick that the children could see only a tiny strip of beach when they looked back. The ocean had disappeared entirely. They could easily have lost their way in coming up the beach.

“How pleased Mummy will be when she sees our new specimen !” cried Elinor, peeping into her blue pail where lay the round, knobby sea urchin.

“Won’t she!” cried Philip, peeping into his red pail, where lay the bristly, greenish-brown sea urchin.

Then they went up the plank walk, down the hill, through the Green Gate, and up the garden walk, and into the big white house.

Their mother was delighted when she saw the two new specimens. But she was surprised when she heard of their narrow escape on the sands.

“You must never, never do such a thing again! Think what might have happened if you had waited a few minutes longer!” she said.

“Now tell us a story-poem, Mummy dear,” said Elinor.

“About a sea urchin, please,” said Philip.

So then their mother told them the story-poem about the Sea Urchin.

## SEA URCHIN

Close to the waves, on a little rock shelf,  
Lives a prickly green Sea Urchin all by himself.  
On the same rocky cliff there are thousands of  
others

Grouped closely together, his sisters and  
brothers.

Round and round, bit by bit, with their sharp  
little teeth

They have gnawed themselves holes in the rock  
ledge beneath :

And sometimes an urchin who's grown big and  
stout

Finds his hole is so small that he cannot get out !

But he's lazy and sleepy and really likes best

To bask and to doze in his warm, cosy nest.

He can reach up and pull off the seaweed behind  
him

And cover himself so you never would find him.

His sharp, prickly spines are a splendid  
protection ;



Some brush, scour, and scrape him off quite to  
perfection ;

Some help him to feel and to hear and to see ;  
He's as neat and complete as an urchin need be.

His tiny tube feet are so supple and strong  
That, slowly but surely, they bear him along,  
When he wants to go walking down into a pool,  
Where the shadows are green and the water  
is cool.





Shells and starfishes left on the rocks as the tide goes down.

## VI. SHELLS

*Patter! patter! patter!* came the rain on the window panes. *Splash! splash! splash!* went rivers of water down the gutters and into the big cistern behind the house. Little brooks ran in every direction along the gravel walks. The trees bent and swayed in the wind which went moaning and roaring through the woods. Leaves were torn from the branches and went fluttering here and there. It was a fearful storm!



Two empty shells.

Daddy stood looking out of the Sea Room window. The children stood beside him.

“I am glad I am not on the water today,” he said. “Last night must have been a bad



one for ships. The storm came on quite suddenly, about midnight. It is still raging. We shall have some surf on the beach after this."

"Oh, can't we go out and see it, Daddy?" cried the children, both at once.

"We've never been out on the beach in a real storm, you know," added Elinor.

"We'd like to see the big, big waves. Won't you take us, Daddy?" pleaded Philip.

"Well! well! You are real little sea dogs, aren't you?" said their father. "We will see. By and by, if the wind goes down a bit, you may come with me for a walk along the beach."

Then the breakfast bell rang. The children could hardly wait until the meal was over, they were so eager to go out and see the storm.

"Oh, Daddy, the wind's gone down a lot!" cried Philip, with his nose to the window pane.

"Yes, there won't be any storm left if we don't go soon, Daddy," said Elinor.

"I guess there will be all the storm you want, kiddies," said their father, laughing, as he looked out of the window. "Listen! I can hear the roar of the surf on the shore, even from here. An hour from now will be time

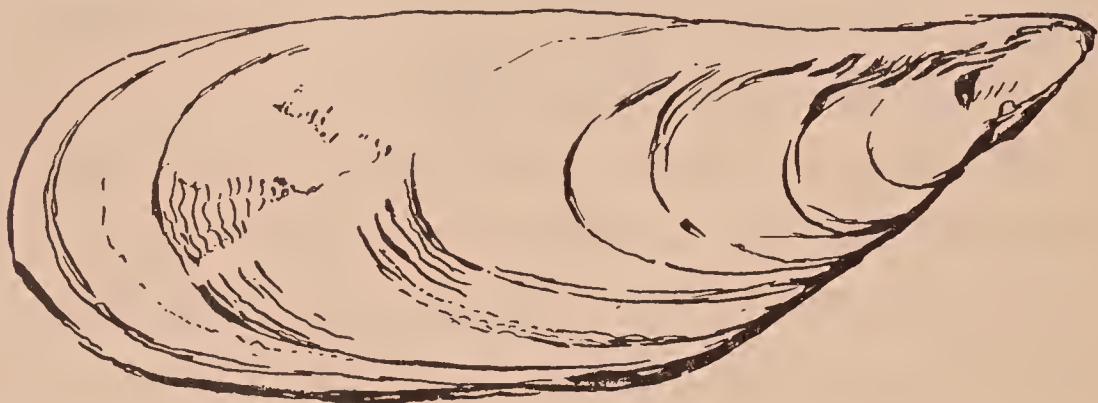
enough to go. It will be a spring tide and a storm at the same time. You will see a fine show!"

An hour later three figures stood at the door of the big white house, then started down the steps and out into the rain. They were all dressed from head to foot in rubber water-proofs, rubber hats and rubber boots. They did not need umbrellas. Besides, an umbrella would have gone inside out in half a minute, the wind was blowing so hard.

Mummy, watching from the window, waved her hand to them as they made their way down the garden walk, and disappeared in the direction of the Green Gate.

Clinging fast to their father's hands, the two children went up the path and stood upon the top of the sand hills looking at the beach. When they first caught sight of it they stood still for a moment in surprise. Then both children screamed aloud. But their voices were drowned in the roaring of the waves and the shrieking of the wind, which would have lifted them off their feet if they had not held to their father's hands.

It was a storm indeed! The tide was not only high, but unusually high. The waves came booming and roaring over the upper part of the beach, far above the high tide mark. All about was frothy white foam, and wave after wave came rushing and tumbling in great green rollers, hurled itself against the land, and burst into spray. The children could feel it on their faces.



An old mussel shell. The curved lines are the lines of growth, and show how mussel shells gradually grow larger and larger.

“See where the water has broken through the sand dunes, and is flowing down on to the marshes, and over the road!” cried their father.

“Oh! oh! oh!” cried Philip and Elinor. They were too astonished to say anything more.

“That is the way the sea gains a footing on the land,” went on their father. “Those sand dunes, with the marsh grass growing high on



their tops, and with the tough grass-roots matted together in a solid mass, make a fine defense against the sea in ordinary weather, but a storm like this breaks all barriers. You see, now that one wave has made a hole through, the next comes tearing after it and pours down on the road beyond, carrying sand with it. That gradually makes the beach more level, so that the sea can come farther and farther in if it chooses. Tides are curious

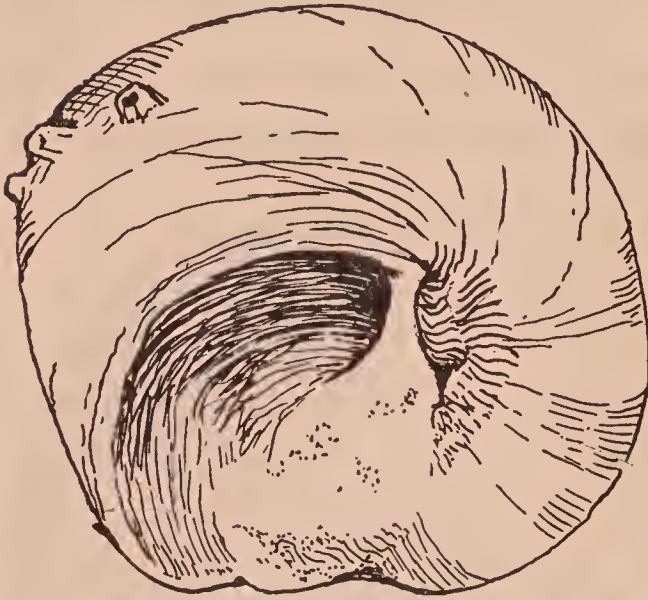


An old Natica shell with barnacles growing on it.

things. Some sea towns have been buried by the sand during one tide. But that does not happen more than once in a hundred years, perhaps. Sometimes, after a hundred years or more, the sea may, for some reason, retreat for good and all, and leave the ruins of the same little town exposed once more. In some parts of this country the sea is gaining on the land, in other parts it is drawing away from it."



It was a wonderful sight to see the waves come up the beach. Over toward the cliffs they could see them dash against the rocks and



Another Natica or sea snail; this also has barnacles growing on it.

send white spray high up in the air. No wonder the rocks were being torn away, little by little! Great spars and pieces of wood were borne along on top of the water like straws. A boat

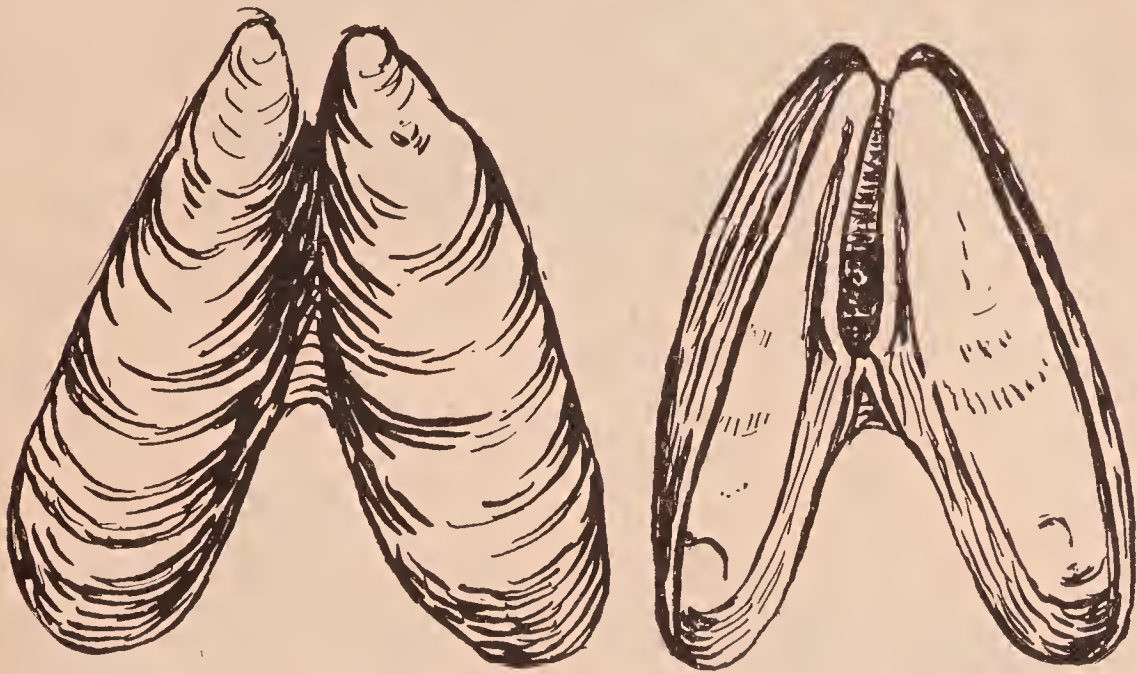
had been dashed to pieces on the rocks, and the fragments were floating about here and there.

It had stopped raining now, and the wind had gone down a little. Holding them fast by the hand, their father started to walk along the beach, very slowly and cautiously.

“The tide has turned,” he said. “I guess the sea has done its worst, for this once, at least.”

Under the shelter of the canvas awning, which, fortunately, had not been torn to bits and blown away by the wind, they stood for a long time

watching the surf. The tide gradually went down so that they could make their way across the sand. Philip and Elinor picked up a great many different kinds of shells, and put them



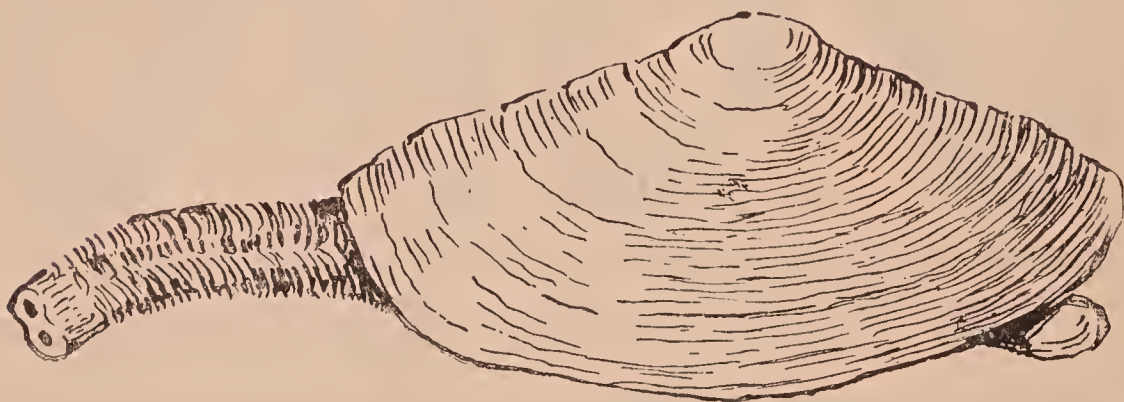
Two open mussel shells : The left picture shows the “lines of growth” ; and the right shows the hinge that holds the pair of shells together.

into their pails. There were tiny ones, of many colors. Some were bright orange, some white with colored stripes. There were pearly white shells that curled round and round and ended in sharp points. There were flat ones with little seats in them like tiny carriages. There were long, narrow shells, that fastened together with hinges. These were called razor shells, their father said, because they looked like ra-

zors. The children were greatly taken with the shells that fitted together like doors. Some were spread open. Some had broken apart.

"This is a clamshell," said their father. "There must be many clams here. Ah! See that little hole in the sand? That is an air hole for a clam. Now let us dig a little here."

A few shovelfuls of sand around the hole were taken away. Then a spurt of water came right up into Philip's face.



A long-necked clam. The neck is really a pair of water tubes and water goes in one tube and out the other. The clam gets its food from the water in this way. A little of the foot shows at the right side of the shell.

"Ha! ha! Mr. Clam is at home, sure enough!" laughed his father. "You may find him by digging, but he is probably boring down into the sand to escape you, while you are engaged in wiping the salt water from your face."



That is his way of protecting himself. Each animal has its own means of protection.”



A mussel showing the threads by which it often fastens itself to rocks and pier posts.

But Philip dug away furiously, and soon brought to light a clam. Its two doors were shut tightly, but through the crack they could see that there was something alive that filled the shell.

“Shells that have two doors are called bivalves. Shells that are all in one piece are univalves. That is a good thing to remember, for all shell animals are divided into those two kinds.”

“These shells with two doors are safer than the others, that have only holes, aren’t they?” asked Elinor.

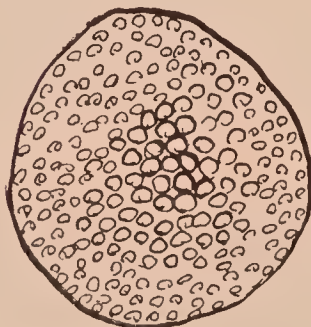




A door of a sea snail's  
shell or house.

“Oh, the univalves have doors, too. But their doors fit closely into the little round holes. They are just as safe. Haven't you seen a live univalve? Come, here is one.”

He held out a little cockle-shell. “See the door? It is partly open. The live creature is inside. Touch it, and see how



Four different kinds of shell doors.

quickly the door closes. Ah! Here is one of the doors, lying by itself on the sand. It is a little golden-brown, round piece of transparent stuff. But it is tough and strong, and makes

a capital door. Different shells have differently shaped doors.”

“Do all shells live ’way down under the sand, like clams?” asked Elinor.



A shell door with very pretty markings.

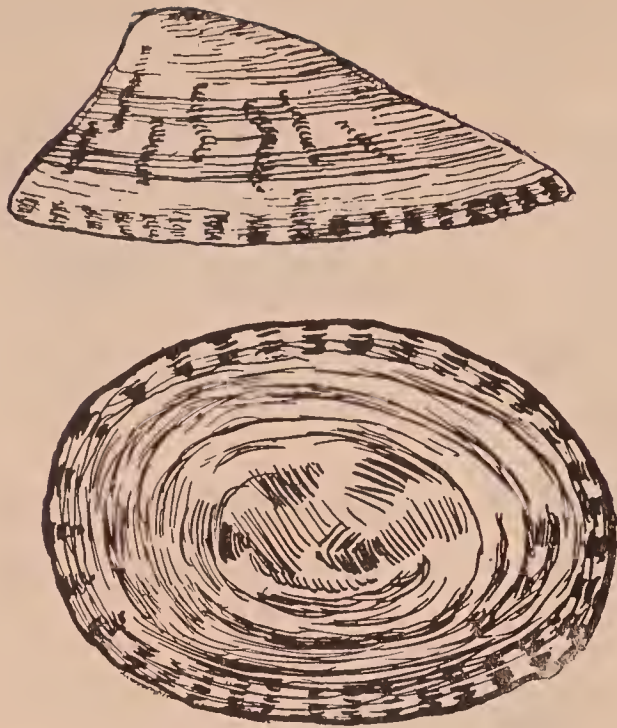
“Most shell animals like to burrow a little under the sand,” answered her father, “but there are very few kinds that go down so far as clams do.



A dead shell, showing just a hole where the door belongs.

Wherever you see little ridges in the sand, you may usually be sure to find some kind of shell animal. Come, it is time to be turning back. It is nearly luncheon time. And I am hungry, aren't you?”

The children ran up the plank walk, down the



Two views of a limpet or Quaker cap; the upper is the side view, and the lower picture shows how the shell appears as you look down on it.

hill, through the Green Gate, along the gravel walk, and into the big white house, where their mother waited for them. She had been afraid that perhaps the wind had blown them all out to sea.

“Here we are, Mummy! And we’ve had a fine time! Oh, the big waves!”

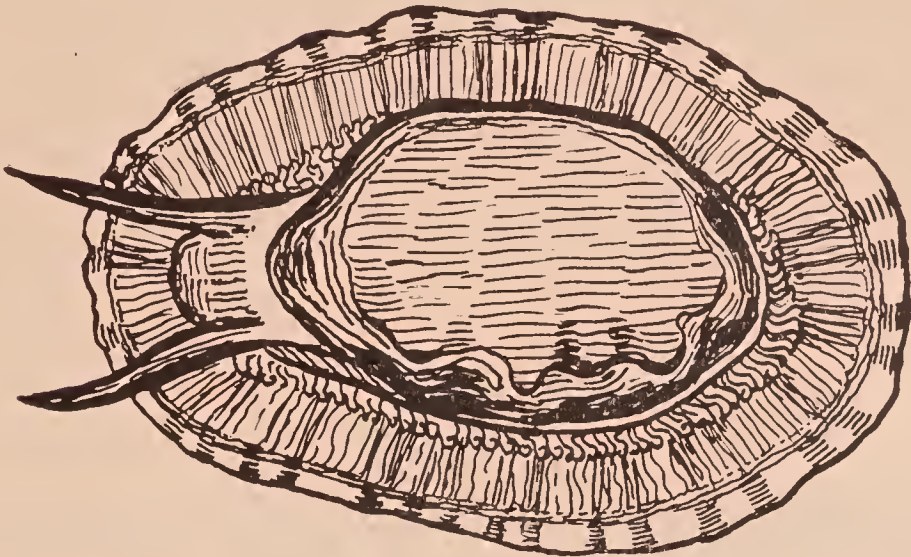
“And we’ve found some lovely, lovely shells! We want to show them to you!”

Mummy spread out a newspaper on the nursery floor, and the children poured their shells out upon it.

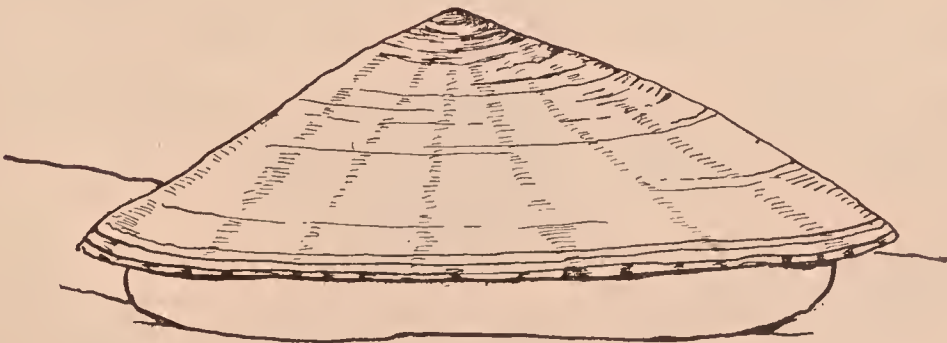
They had a great many kinds — cunning little cockle-shells, tiny round shells of all colors, bright yellow, white, brown, and gray; long shells drawn out into points and curving about in lovely whorls; shells with stripes; shells with



spots; pretty limpets, or Quaker caps as they are sometimes called because they look like little round hats with pointed crowns; and round, shiny shells. It was a beautiful collection.



The under side of a limpet. The head has two feelers like the snail's.



A limpet, with the shell raised so that the animal can creep along.

“This one looks very much like a fresh-water snail,” said their mother, picking up a round shell. “It walks along on its large foot, dragging its house upon its back just as a snail does. It has little horns in front, and two tiny eyes



to see with. On the back of its foot is its door, which is usually an exact fit to the opening of the shell. When the little animal wants to go inside, he draws himself within, and the last



A snail walking on its foot. Notice its two feelers; the pipe through which the snail gets its water is waving around above it. The door shows at the left of the shell.

thing to go is the door, which falls into place right over the opening. Isn't that wonderful?"

"This one looks as though it had been twisted around and around," said Elinor.

"Yes, that is the way they grow. Each twist or whorl shows a new time of its growth. It is very interesting. Sometime you will learn all about shells. There is nothing more beautiful in the world than a shell, I think."

"I should think those little thin ones would get broken all to bits in a storm," said Elinor.

“After they are thrown up on the beach the empty shells get broken, but when they are alive the shell-animals seem to know how to protect themselves. They know where to hide, and what are the best places to live in. But it is time to get ready for luncheon now. You have had an eventful morning, dears.”

The children soon appeared, washed and dressed.

“Now, a story, please,” said Philip.

“About a shell,” said Elinor.

“There are any number of things that could be told about shells,” said their mother. “Well, I will tell you a story-poem about Shells.”



An empty snail shell. Hermit crabs often kill and eat these snails and then live in their shells.

## SHELLS

Oh, what lovely, pearly shells,  
Lying on the beach !  
Some I see beneath the waves  
Just beyond our reach.

Now, I've found an empty one ;  
Round and round it curls,  
Starting in a point above  
In whorls and whorls and whorls.

Watch for little grooves of sand ;  
That's the way you know  
A living, breathing creature  
Is hidden down below.

Take your little shovel ;  
Dig down carefully ;  
Underneath the shell his foot  
Clearly you can see.

With his shield thrust forward  
He is walking now ;  
Pushing sand to left and right,  
A sturdy little plow.

Ah ! He knows you're looking !  
In a moment more  
He draws himself within his house,  
And closes up his door.





This brown seaweed or rockweed is very common along our Eastern coast.

## VII. THE SAND DOLLAR

A few days later the children were up bright and early. It was a beautiful day. The sky was a deep blue. Light, fleecy clouds floated in the sky. The sun shone brightly. You would not have thought that there could be such a thing as a storm.

As soon as breakfast was over the children were eager to go to the beach. It seemed to take their mother such a long time to get ready! The last thing she did before starting was to fold up some pieces of paper and put them in her straw bag. Then she took some matches in a little box and put them into the bag beside the paper.

“Oh, what are you taking matches for, Mummy?” asked Elinor.

“There is very little wind today, and it is rather cool. I thought we might build a drift-wood fire on the beach.”

“Oh, what fun!” cried Philip.

“If we do, children, you must be very, very

careful and not go too near the fire, for the wind blows things about when one is out of doors, and fires are dangerous things to deal with. Don't forget, will you, dears?"

"No, Mummy, we won't forget. We don't want to get burned up," said Elinor.

"And we won't burn you up, either, Mummy dear," added Philip.

"The chief thing to fear is forest fires," said their mother. "People are careless sometimes. They leave a spark burning. It smoulders and smokes. By and by the wind rises, blows the spark into a flame, and the flame crawls along the ground until it reaches the bushes and trees. Great forests have been destroyed in this way. Think of the beautiful trees being burned up, and all through someone's carelessness!"

"We won't be careless, Mummy. We won't forget, will we, Philip?"

"No, we won't forget," repeated Philip.

The beach was a mass of wreckage from end to end. Far above high tide mark were heaps of all kinds of things. The holes in the sand dunes showed where the water had poured



through during the recent storm. A great pond still stood on the marshes beyond, and the road



An old mussel shell with seaweeds, barnacles and shells growing on it.

was a foot deep in water. If another big tide came today, the path was made easy for the sea to come through the same opening, make it wider, and level the sand around the opening by scattering it about. Then every high tide might come through. But the wind would help build a barrier by blowing the sand back into place. The marsh grass would spread its roots and make the barrier firmer.

Elinor and Philip ran back and forth along the beach collecting driftwood. Some of the wood was still wet and heavy. But some of



it was dry. Mummy found a nice place for the fire, in front of a rock that was hollowed out so that it formed a sort of fireplace. The children threw the dry wood down in a heap near by. Their mother took a match, some paper, and some tiny bits of light wood, which she placed criss-cross. Then she lighted a match. The wind blew it out. She tried another. But a mischievous puff of wind came, and out it went !

“The third time never fails,” she said.

A bright flame flickered up, caught the paper and sticks. Carefully at first, piece by piece, more wood was put on, until a bright blaze told that the fire was really going. Then the children threw on driftwood. It crackled and blazed brightly, making a pretty picture against the blue sea and sky.

Philip and Elinor danced about it, throwing in piece after piece of wood, which took on all sorts of lovely colors in the flames. They put on bunches of dry seaweed that spluttered and crackled and sent up clouds of smoke. Larger and larger pieces were thrown on ; spars from a ship, a broken side of a lobster pot, an old

dried tree stump that had whitened in the sun and wind. It was a glorious fire, indeed!

Then the sea came creeping up, step by step. A wave struck against the rock and sent some spray hissing into the fire. Then a wave ran into the fire with a swish. Smoke went up, but the fire blazed on. Then another wave leaped in, as though the sea was determined to quench the fire at once. This time it seemed to have conquered. But up flickered a flame on the farther side.

*Hiss! hiss-ss! splash!* The fire was out!

“Oh, see what I’ve found!” cried Elinor, brushing aside the sand and picking up something which she laid flat in her palm.

“Why, it is round and thin, like a piece of money!” said Philip.

“It is made of sand, I think,” said Elinor. “No, it is a shell. No, it doesn’t look like a shell exactly, either.”

“Let’s show it to Mummy,” said Philip.

So they took it to Mummy, who was sitting on a rock watching the tide go down.

“Oh,” she said, “you have found a sand dollar. There must be others around on the

beach, too. But I have not often found them here. If you find one you may find others. They are sometimes called cake urchins, or sand cakes."

"But what is it, Mummy? Is it a shell?" asked Philip.

"It is more like a sea urchin than anything else, isn't it? It is a cousin of the sea urchin and of the starfish, too. It belongs to the ray family. See the design on its back. Does not that remind you a little of the design on the back of a sea urchin? It does look like a piece of money, doesn't it? That's why they call it a sand dollar. That's easy to remember. A silver dollar used to be of about that size."

"Here's a little one. It's darker than yours," said Philip.

"But you can see the little figure on its back," said Elinor.

"When the sand dollar is alive it is covered with spines," said their mother. "It is a purple color then. But when it is exposed to the air the spines turn green. Sand dollars live mostly in sand below the water, and where the surf dashes on the beaches. See, the mouth is this hole



on the under side. The figure that looks like a lovely, petal-shaped design, like a flower, is formed by the little tube-feet which run in five petal-shaped lines. I have been told that the fishermen grind up the shells and make ink of them."



A sand dollar, without any spines left in it, and showing clearly the five-petal pattern.

"I wish we could find one with the spines on," said Elinor.

"We are not likely to find one on the beach. These have lain in the hot sun until their fine, silky hairs have dried and then fallen off."

"Here is a lovely one, almost white," said Elinor. "We have another thing to add to our collection!"



The tide had gone down a good deal. Elinor and Philip went in wading. They danced and splashed and chased the waves; then turned and ran away just in time to escape them. Who could believe that the playful, sparkling waves belonged to the same ocean that had come thundering and bellowing up the beach such a short time before!

The children's pails were soon filled with shells and pebbles, sea urchins, sand dollars, crab shells, cunning little Quaker caps of different sizes, seaweed, and other things.



Old worn snail shells, showing the spiral or whorl at the top.

"Come, dears. It is time to go home, now," came their mother's voice.

So they gathered together their pails and shovels and went across the beach, up the plank

walk, down the hill, through the Green Gate, along the garden walk, and into the big white house.

Elinor and Philip stowed their precious things safely away at the end of the piazza.

“Now tell us a story, please, Mummy,” they begged.

“What shall it be about today?” she asked.

“Oh, tell about a sand dollar.”

So Mummy told them the story-poem of the Sand Dollar.

## SAND DOLLAR

Now what have we here, covered up with the sand?

Pick it up. Brush it off. Lay it flat on your hand.

It is called a Sand Dollar — a thin little cake, Like a cookie of sand, with a very hard bake.

It looks like a dollar ; a little bit bigger ;  
On its surface you see a five-petal shaped figure.  
This figure is formed by the tiny tube-feet.  
Its mouth is the center, and here the tubes meet.

Just look all about ! They are here by the dozen !

You see, the Sand Dollar is really a cousin  
To sea urchins : yes, and to starfishes, too ;  
They're relations exactly like me and like you.

They're found below tide-mark when they are alive.

You scarcely would find one unless you could dive.

They are covered with spines soft and silky,  
like hair ;

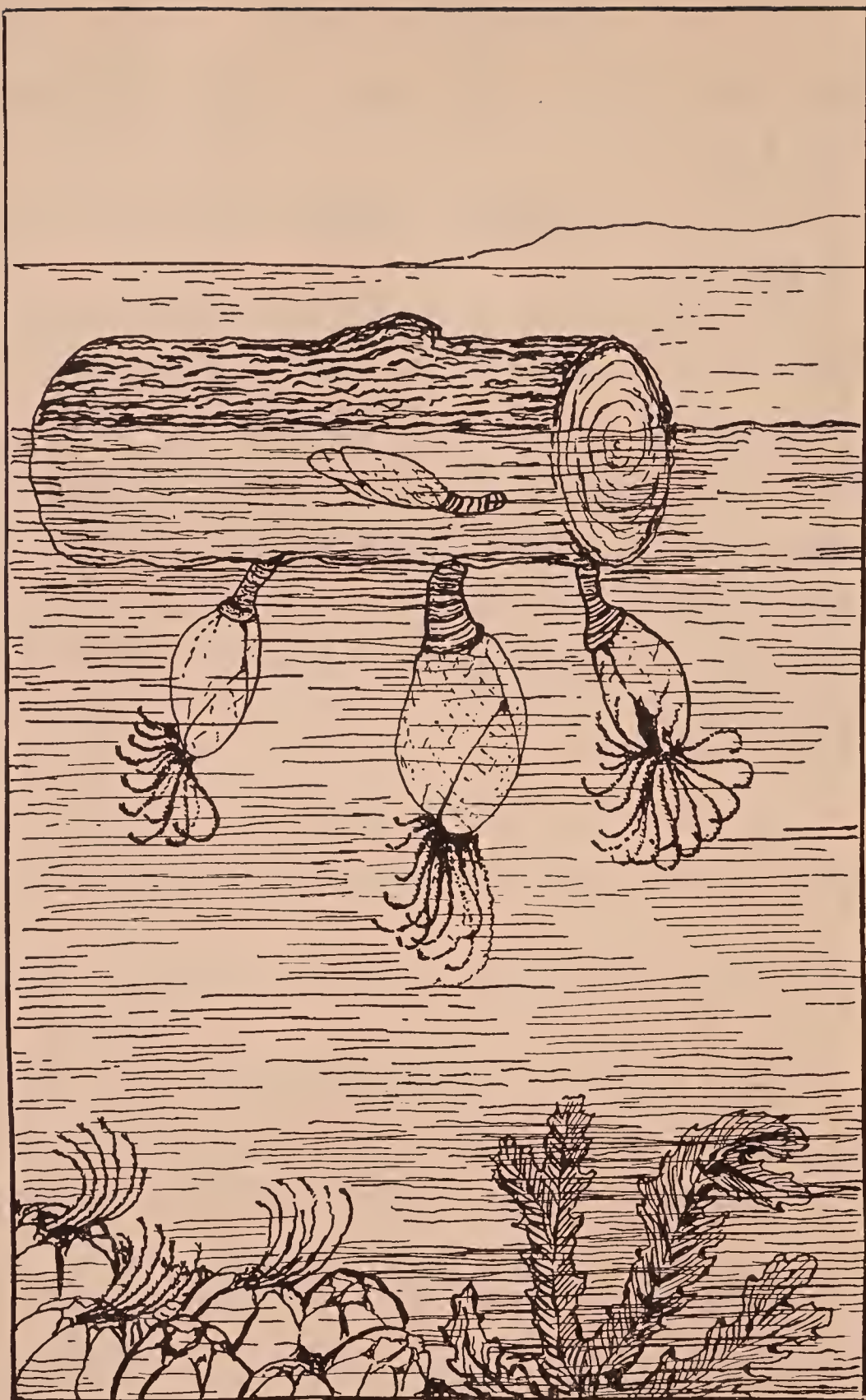
Purple-brown, turning green when left out  
in the air.

When they've lain on the beach in the heat of  
the sun,

These hairs become dry and fall off, every one,  
Leaving just a sand dollar, and — what do  
you think ?

Grind them up and they're said to make very  
good ink !





Goose barnacles fast to a floating log. These are often seen on posts of piers and bottoms of boats.

## VIII. BARNACLES

“Where’s Mummy?” asked Philip, raising his head from the work that he was doing. He was making a barn, surrounded by a large barnyard with a high fence, all made of sand.

“Why, she is sitting under the awning, isn’t she?” asked Elinor. She was making a lovely house and garden.

They turned and looked at the place where their mother usually sat, under the canvas awning. She was not there!

They ran to and fro on the beach, calling her. No answer came. Then they looked along the shore. They could see everything on the beach as far as the cliffs where the sea pools were. Their mother had told them not to go there without her. But she must be there herself.

“She must be somewhere, mustn’t she?” said Philip, much puzzled.

“Of course she is somewhere. She wouldn’t go off and leave us,” said Elinor.

“Let’s go and find her,” suggested Philip.

So, with a regretful look at their uncompleted work of house and farm building, the two children took their pails and shovels and started down the beach towards the cliffs.

Little Mr. Crab poked his head out at them from behind a rock. He eyed them in a friendly way, they thought. They were old comrades now.

Sea urchins lay about. That is to say, their empty shells did. Some were bare, some were partly covered with half-dried prickles. In a little pool between two rocks a live one lay. His spines were bright green, with some brown ones running in lines down his back.

“Hello, Mr. Sea Urchin! It must be nice and cool in that pool,” said Elinor.

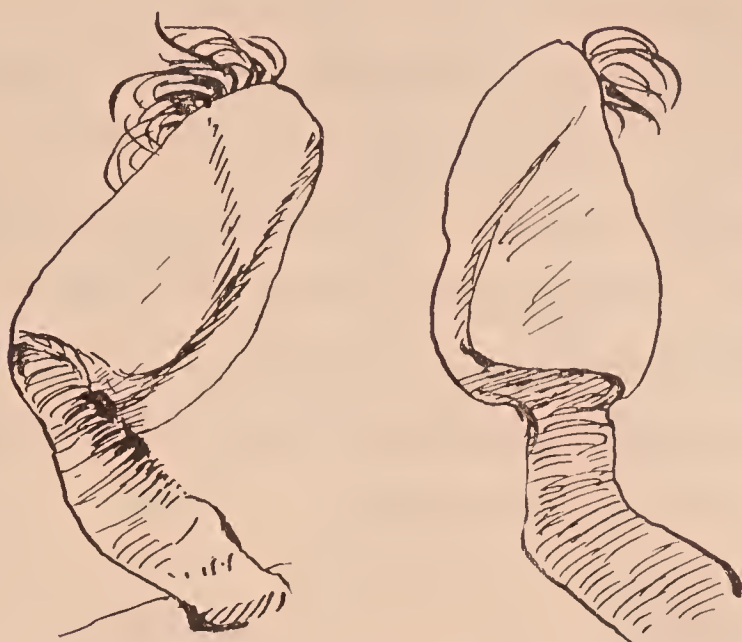
“See the starfishes! Why, they are all curled up!” said Philip.

“They are waiting for the tide to come back, I suppose,” said Elinor.

Long pieces of kelp covered the beach. Their graceful leaf ends were spread out and curled in every direction. Their root ends were fastened tightly to stones and little shells, bar-



nacles, and all sorts of things that were packed closely together and held in a bunch by the strong roots.



Goose-necked barnacles with their shells partly closed.

“She must be here, of course,” said Elinor, looking around.

“Perhaps she is behind that big rock,” said Philip.

As they went farther down the beach, the rocks began to loom up before them. They began to walk over sharp stones and slippery seaweed. It was funny seaweed, golden brown in color, with little berries on it, like tiny balloons filled with air. They burst with a pop when squeezed. The little balloons seemed



to be made on purpose to float on top of the water. Tiny shell-animals and limpets were fastened to the branches. They clung so tightly that it was hard to pull them off.

“See, here’s a shell with its door open! Oh, how funny!” cried Elinor.

Philip ran to see. The shell door was opening wider! Out came a white body, with a pair of little horns on its head. This way and that it turned, as though in search of something. It was a sea snail.



Two pictures of a sea snail. The snail on the left has closed his door. The one on the right is out and moving around; the door shows to the left of his shell.

“Let’s put him down and see what he will do,” said Elinor.

So they put him down on a rock, and he began to walk along. A walking shell was an odd sight to the children. Soon it came to a piece

of seaweed which seemed to suit it. There it stopped and refused to go farther.

Soon the children came to a large pool. It was quite deep in the middle. They waded into it and began to play. It was fortunate that they had on their bathing suits, for they often slipped and fell into the water. They found a chip of wood with a string tied to it. It made a fine raft. Many treasures were transported across from one shore to the other. It was a fine place to play in.

“Hello! Hello, children! Where are you?”

It was their mother’s voice. It came from near by.

Elinor looked up, and all around. She could not see anyone at first.

“Where are you, Mummy? Here we are. We were looking for you,” they answered.

“But we forgot all about looking for you,” added Philip.

They could see a head sticking straight up from behind a rock. It was their mother.

“Come over here and see the barnacles!”

So the two children went scrambling over the rocks towards their mother. They saw

lovely little pools here and there, half hidden among the seaweeds. Elinor found some Quaker caps. But instead of being empty caps, like those that she had found on the beach, these were fastened to the seaweed or the rocks. One was on a shell. Its little soft body enveloped the top of the shell and held tightly.

Philip found some "white holes," as he called them, all over the rocks. They were little circular knobs of hard, white shell. There were cracks in the shell, as though it had been pieced together. Many of them had holes in the middle, and, looking in, you could see that they were empty. Others had shell doors covering the holes. That usually meant that the little animal was still alive inside his house, or "inside his head," as Elinor put it.

"Come and look closely, dears," said their mother, when they drew near.

She was bending over a pool, with her face close to the water's surface. The children bent close down, too.

"What is it?" asked Philip.

"Barnacles. You have some empty barnacle

shells in your hand, Philip. These barnacles are alive. Look underneath the water. See, their tiny doors are open wide. Their threadlike tentacles, or feelers, or legs are feeling about in all directions. Those little hairlike things are their legs. And they are kicking food into their mouths. They look like little round heads, with no bodies, don't they?"



A goose barnacle with its feathery feet pushed out into the ocean water. With these feet the barnacle kicks its food into its mouth.

"Oh! Oh! See all the little legs kicking!" cried Philip.

"When they are under water there is food all around them in it. All they have to do is to gather it into their mouths. When they are high and dry they close their shell doors and look like little white crusts on the rocks. Now, knock on the rock and see what happens, Philip."

Philip rapped on the rock with his fist.



“Listen carefully,” whispered their mother.

Very faintly, they could hear a *click! click! clicking!* all around them in the little pool. The barnacles were shutting their doors!

“That is what they do when visitors come,” said their mother. “They are not sure whether you intend to meddle with them or not. So they shut their little doors, and there they are, safe and snug in their shell houses. Wait a while and they will slowly open them again when they think all danger is past.”

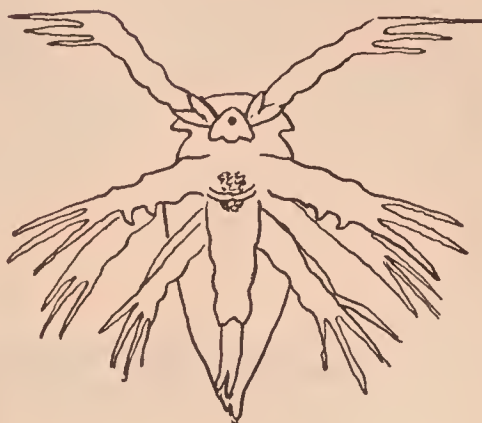
One by one, slowly and cautiously, the doors opened, out crept the tiny feelers, and in a minute or two waved to and fro as before. Soon the entire pool was alive with the movement.

For a long time the children watched the barnacles. Above the pool, on the rocks, were thousands of them, high and dry, with close-shut doors, looking as though they were a part of the rock itself.

How quickly their pails filled with strange and curious things! Elinor picked up a roundish piece of brown thin substance. It was a shell door, which had once been a perfect fit for some shell-animal's home.

“To think that those little white things that we see all over the rocks are really alive,” said Elinor, as they passed the barnacle-covered rocks.

“You will be more surprised when I tell you that the little baby barnacle, when it comes out of its nursery is very different from a full grown



A baby barnacle just hatched from the egg. It is smaller than this letter *i*, and cannot be seen without a magnifying glass.

one. It is a little animal with one eye, three pairs of legs, and a shell. It swims about for a little while, shedding its shell several times and each time getting a new one. Then, for a while it has two eyes, six pairs of legs, and two shells! Now it begins to look for a home. It fastens itself to a rock with its feelers, and a kind of cement in its body somehow sticks it to the rock securely. Then a new bivalve shell grows, and also curled, feathery legs. It sheds its skin as it grows, parts of it at a time. The lines on its shell show how it has grown up out of the old part of the shell. When it sheds its

skin in the spring the thin, shining coat floats about on the water. There is a kind of barnacle that fastens to ships and floating logs."



A mussel shell with one barnacle growing on it; there is also a scar where a barnacle has been broken off. Sometimes so many of these barnacles grow on the bottoms of boats that they have to be scraped off so that the boat can move through the water with greater ease.

"I shall put these barnacle shells in our collection," said Philip.

"I think barnacles are as interesting as anything that we've found," said Elinor. "And who would think they were interesting at all, to look at them on the rocks?"

The tide was coming up. The beach grew narrower and smaller as they crossed it and went up the plank walk, down the hill, through the Green Gate, along the garden walk, and into the big white house.

“What shall the story-poem be today?” asked their mother, smiling. She knew what it would be.

“Oh, barnacles, barnacles!” cried both children together.

So she told them the story-poem about Barnacles.



## BARNACLES

Barnacles, Barnacles,  
Clinging to the rock,  
Are you all at home today?  
*Knock! Knock! Knock!*

Listen, now! They seem to think  
Visitors are bores!  
*Click-a-click! Click-a-click!*  
Shut the tiny doors.

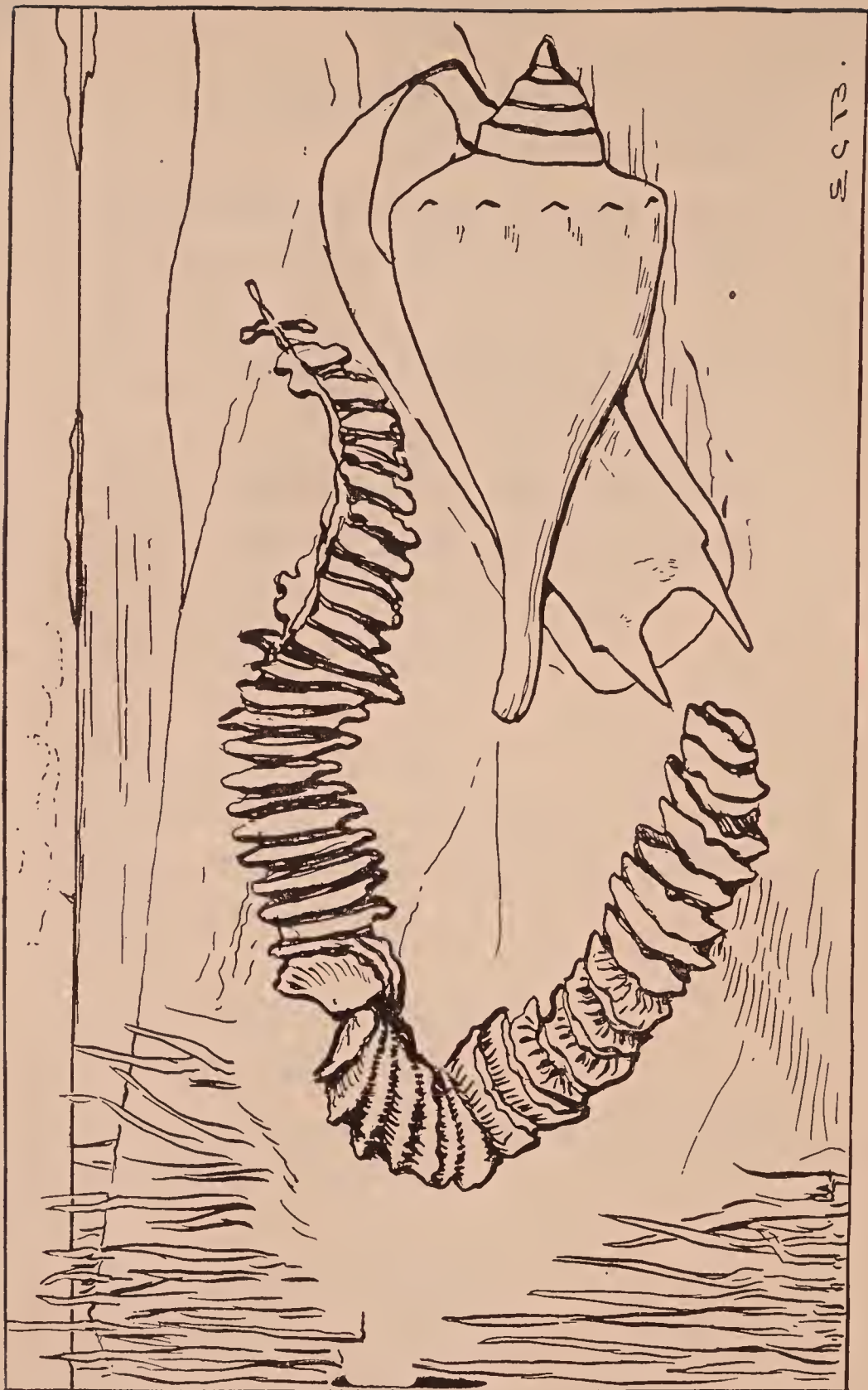
Little Sea Acorns  
Fastened by their heads;  
Glued with cement tight and strong  
Fast to rocky beds.

Cautiously and carefully  
Lid-doors open wide;  
Thread-like legs are stretching forth,  
Covered by the tide.

Tiny feathered feelers  
Reaching high and low,  
Thousands moving all at once,  
Waving to and fro.

Stretching out, drawing back,  
Busy feathered feet  
Carry food to open mouths —  
That's the way they eat!

Piece by piece, one by one,  
Split the skins, and, lo!  
A bit is added to the shell —  
That's the way they grow!



A knobbed whelk, one of the pear-shaped sea snails, and a deserted nursery.

## IX. THE JELLY-FISH

Philip and Elinor were up bright and early the next morning. The sun was pouring brightly into the nursery window. The crows were cawing in the trees outside. Sea gulls flew over the tree-tops on their way to the sea. Their shrill calls could be heard for a long distance. They were used to making their voices heard above the noise of winds and waves.

As soon as they could get started after breakfast the children were at the door waiting for their mother. She soon joined them and they all went down the garden walk, through the Green Gate, up the hill, down the plank walk, and on to their beloved beach. They danced and sang. It was such a lovely, lovely day, and it was so good to be out in the sunshine.

“I shall sit here in the shade for a while,” said their mother, finding a comfortable spot in the shelter of a rock. “If you want me, call, and I shall hear you. Do not wander too far away, dears.”



So the children went racing and romping along the glistening beach. They had taken off their shoes and stockings, and their clothes were pinned up so as to be out of the way when they went in wading. Soon they came to something that they had never seen before. It looked like a long string of seed pods, like those in Uncle John's vegetable garden in the fall. The pods were quite empty. They were curved through the middle, and rattled dryly when Philip shook them.

"What do you suppose it can be?" asked Philip.

"It looks something like a wrinkled-up snake's skin," said Elinor.

"But it can't be that. Snakes don't live on the beach, do they?" asked Philip.

"No, they don't. Let's show it to Mummy," said Elinor.

So they scampered up the beach, dragging the long string of pods after them.

Their mother looked up from her book. "Well, what have you found now?" she asked.

"We don't know what it is. What is it, Mummy?" asked Elinor.

“It is an empty nursery. The children have grown up and have left their first home for larger quarters.”

“A nursery! Why, it looks like a snake’s skin!” cried Philip.

“They are sometimes called ‘vegetable rattlesnakes,’ these cast-off nurseries. But they are not vegetables at all, but animal homes. The baby whelks who lived in them for a while, now have nice homes of their own which they carry about with them on their backs.”

“On their backs! How funny!” laughed Philip.

“Yes, the whelk is a small shell-animal shaped like a snail, only drawn out longer at one end into a sort of canal, which makes its shell pear-shaped. Because their shells are pear-shaped, some of these sea-snails are called *Pyrula*. *Pyrula* is a Latin word meaning ‘little pear.’ The scientists who named them thought that would help us to remember. And it does help, doesn’t it?”

“*Py-ru-la*, ‘little pear,’” said Elinor. “Yes, I think I shall remember that.”

“When baby *Pyrula* gets big enough he leaves his nest, which is one of these pods here.

At first there are many little ones together in each nest, but before long the pods are all empty. Then the strings of empty pods are washed up on the shore, just as this one has been cast up. They are often even longer than this one, a yard long, perhaps."

"What does he look like when he is grown up?" asked Elinor.

"A grown-up Pyrula is an odd-looking little fellow. His house is built over his back, just as a lady holds her parasol when the sun is behind her. His head has little feelers, or tentacles, as they are called, and he has eyes on them which stick out, so he can see his way quite clearly. His foot drags behind him like a trailing dress. This foot supports the door of his house."

"Oh, how funny!" cried the children again.

"He is really a very interesting little animal. He has only one foot. But that foot is as good as a dozen ordinary feet. On it he creeps about wherever he wants to go; but enough of it drags behind to support the door. And, when he wants to he can draw that foot completely within his house, and close the door after him!"

“What is his door made of? Is it like those thin, round, yellow things with a curl on one end?” asked Elinor.

“His door is a thin oval-shaped piece that just fits the opening. When it is closed tight you might mistake the shell for an empty one. In olden times people called it the ‘Tower of Babel Fig Shell,’ for, you see, they thought that it was shaped like a fig. It is, somewhat.”

“Tell some more. How does the baby get into the water?” asked Philip.



The picture on the left (*a*) shows four egg-cases. The egg-case on the right is marked *s* to show where it was fastened to the stem, and *o* to show where the little baby shell-animals come out.

“The baby whelk lives in the water. When the baby is little he is in one of these little pods or compartments, as I told you. There are many different rooms, and in each room are several babies. There they live and grow,



protected from their enemies, until they are big enough to look out for themselves. Then, suddenly, a round door in the front opens! Out run the children, and scamper straight into the sea. They are very tiny even then — not so long as your finger nail. Their shells are very thin at first, but they harden as they grow. When the shell is six or seven inches long the *Pyrula* is really grown up.”

“My! I wish we could see one grown up!” said Elinor.

“You would laugh to hear some of his long names. But you would find it hard to remember them. *Pyrula* and *whelk* will be enough for you, at present.”

“I hope he doesn’t have to remember all his names,” said Philip.

“No, he has never even heard of any of them,” laughed Mummy.

“Now let us see what else we shall find,” said Elinor.

So they went along the beach. Pretty soon Philip stopped short.

“What is that?” he said, pointing to a long, snake-like object lying on the sand.

“It really looks like a snake, doesn’t it?” he whispered. “Perhaps this really is one.”

“It lies very still,” said Elinor.

They crept up closer and closer, ready to fly at the least movement of the long, thin snake. It lay coiled in a circle with its head up. All of a sudden Elinor burst out laughing.

“Why, it is only a long piece of kelp. But it hasn’t any leaf end, and — look, Philip! It’s holding a stone in its hand!”

Philip seized an end of it and unwound it. The root end, which had been fastened to the bottom of the sea when it was torn up, still held fast to a stone. The stone was all encrusted with a pink crust. And there were little shells and seaweed fastened to it, too!

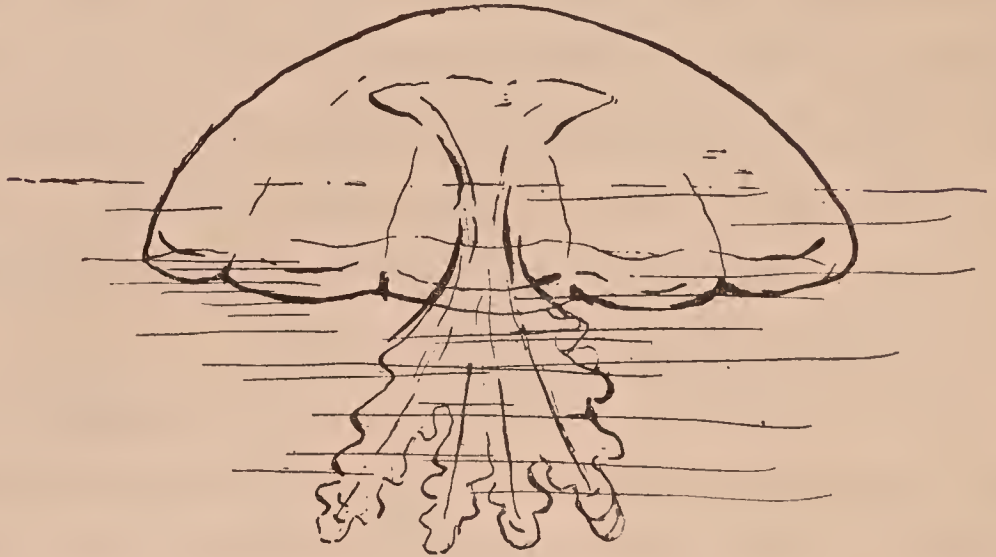
“We will take this home,” said Philip, hanging an end of the snake over his arm and trailing it behind him.

“Here is something! The funniest thing of all! Oh, Elinor! Come and look!” he cried, a moment later.

There, lying at his feet, was a round mass of red jelly! It was motionless: not alive, evidently. What could it be?

“Let us call Mummy. There she is now,” said Elinor.

“Look, Mummy! We’ve found some jelly pudding on the sand!” cried Philip.



This jelly-fish is very much more common along our coast than the kind in the next picture. This jelly-fish has very short tentacles all around the edge.

His mother laughed. “That is a jelly-fish,” she said. “Some people call it a sun jelly; some call it a sun fish; but that is not its name at all. There is a fish called a sun fish, you know, not at all like this. Medusa is the jelly-fish’s other name. That is a pretty name, isn’t it?”

“That is a very pretty name. But is it an animal? It must be queer to be made of jelly,” said Elinor.

“Isn’t it funny! Does it live in the water?” asked Philip.

“Yes, it floats lazily about in the water. When the sun shines it comes up and floats on the surface. It is a beautiful thing when it is in its home, the sea. It has a lovely design on its back, — that is, on its upper surface. Perhaps we may see a live one some day. Then you can see how pretty it is. At the end of the summer, after a happy life in the waves, it is washed up on the sands or among the rocks, and looks like a mass of jelly. It is almost all water, and the heat of the sun dries it up in a short time, so that there is nothing left of it.”

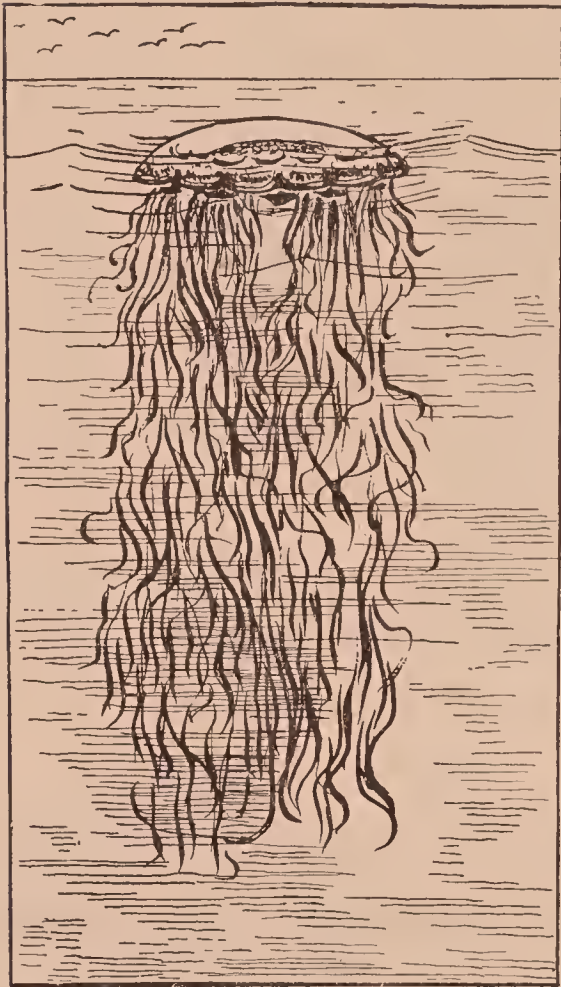
“It hasn’t any shell to protect it, has it?” asked Elinor.

“No, it has no shell, but it has thread-like feelers, or tentacles that can sting quite badly. They are a fine protection. You should see Medusa floating in the water, with all her colored streamers trailing about her. When we go out in the motor boat this afternoon we will look for them. This is the time of year to see them floating near shore. Their days of usefulness are over.”



“What are they like when they are little?” asked Philip.

“The babies are very tiny. In the spring they float about, attach themselves to a rock,



One of the large jelly-fish not often found on our shores. These are sometimes three to five feet wide and have tentacles which may be thirty to forty feet long.

and stay until they have grown big enough to float freely about in the water-world which is their home.”

“Can’t we take it home and put it in our collection?” asked Philip.

“It is not best to touch it. Its feelers are still poisonous, they say. We shall have to remember how it looked, instead, shall we not?”

It was time to go back, for that afternoon the children were going on a motor boat ride with Daddy, Mummy, Uncle John, and Auntie May. So, with a regretful look at

Medusa, lying on the sand, they went back along the beach, up the plank walk, down the hill, through the Green Gate, along the garden walk, and into the big white house.

Philip put his sea serpent, as he called the long snake-like piece of kelp, in a corner of the piazza with the other treasures from the beach. Elinor put the long snake-like pods of the *Pyru-la*'s nursery beside it.

And then they said, "A story, please, Mummy."

"What shall it be about today, dears?"

"Oh, about Medusa," said Elinor.

"Yes, about the jelly-fish," said Philip.

So their mother told them the story-poem about the Jelly-Fish.



An empty rock barnacle, worn down by the waves.

## JELLY-FISH

I'm Medusa, the Sun Fish.  
I float to and fro  
On the sea with the tides  
As they ebb and they flow.

Like a vision of beauty  
I dreamily lie  
In the warm, rippling waves  
While the sun is on high.

Like a floating umbrella  
I open and close.  
Long streamers sway round me  
Of amber and rose.

If danger approaches,  
Although I've no shell,  
I have threads that can sting;  
They protect me quite well.

In spring I'm so tiny!  
I'm only a baby!  
But I grow very fast  
For a month or two, maybe.

Through the long summer season  
I'm happy and free.

In the waves, now and then,  
You catch glimpses of me.

Cast high on the sand  
You will find me one day.  
But the sun dries me up.  
And I vanish away.

Yes, this old Jelly-Fish  
Without beauty or motion  
Was the shining Medusa  
Who lived in the ocean!





Two hermit crabs, with their soft bodies safely tucked away into their hard shells.

## X. THE HERMIT CRAB

“I wish we might go farther down on the beach today,” said Elinor, as they stood on the bluffs one bright September morning.

“Oh, yes, where the tide pools are. We’ve got on our bathing suits, and we’re not afraid of getting wet. Let’s go ’way out to the farthest rocks!” cried Philip.

“Yes, yes! And the tide is out beyond White Rock, and won’t be back for a long time!” added Elinor.

“And we may find something — Oh, think what we might find!” cried Philip.

So they went down, past the shining sands, past Pebbly Beach, and out on to the rocks. They stepped carefully on to the bare places that were not covered with slippery seaweed. But sometimes the rocks themselves were slippery and first Elinor would go — *splash!* — into a pool of water that had been left by the tide; and the next minute — *ker-plump!* — *splash!* Philip would go into another. The

crabs and starfishes and other inhabitants of the pools were much surprised, but the children did not care a bit. They picked themselves up, laughing.

“What funny little berries the seaweed has!” said Philip.

He took one in his fingers and squeezed it. It burst with a loud pop. This was fun. He squeezed a great many, laughing to hear them *pop! pop! pop!*

“They are just like little balloons, aren’t they? See, they float on top of the water, they are so light. And they hold the seaweed up, too.”

“What lots of seaweed! Some is brown, and some is red —”

“And some is green and some is almost black. There is the golden-brown kind with the berries, and the dark brown kind that hangs over the rocks and looks like hair,” went on Elinor.

“And the red kind that grows out on those farthest rocks, and this green kind that’s so pretty.”

“And here’s some funny stiff seaweed that branches. See the little periwinkle shells cling-

ing all over it. Why, there are thousands of them!" said Elinor.

"These little black shells we played were cows. And the white ones were sheep," said Philip.

There were starfishes lying about in the pools, huddled together in all sorts of odd positions.

"Can they be alive?" asked Philip.

"I guess they're just waiting for the sea to come back. Perhaps that's the way they sleep," said Elinor.

"Oh, children! Come and look!" said their mother.

She was stooping over, looking down into a pool. They drew near and looked too.

"Oh-h! Why, it must be the door of Fairyland!" whispered Elinor.

"Oh-h!" said Philip, under his breath.

It was so wonderful that they did not dare to speak aloud for fear that it might vanish entirely away!

The floor of the pool was covered with a crust of salmon pink. Here and there were spots of a bright, pale green. Red, brown, and green



moss hung from the sides of the pool, in tufts, here and there. On the floor were all sorts of lovely shells. Soft bunches of green, red, and yellow sponge were fastened to the walls. The children had never seen anything so beautiful before.



Sea anemones and seaweed. One sea anemone is nearly closed; the others have their feelers out to get food.

“Now look at the rock down in the water,” said their mother. “What do you see?”

“Why, some round bunches with lovely fringy flowers growing out of them. What can they be?” asked Elinor.

“They are sea anemones. See the tiny scarlet one over there, about as big as a strawberry? There is another one, open, with its branches spread out. See, here is a big brown one, nearly as big as a door knob. Ah, Philip! You knocked a bit of shell into the water! Now see them close up. They are easily frightened.”

One by one the fringed feelers drew back into the little creatures' mouths, leaving a round bunch clinging to the rock.

“The fringe that waves to and fro is carrying food into their mouths all the time. The water is full of all kinds of food that they like. That is the way they eat. See, they think that the danger that they feared is gone. They are opening again.”

One by one, the delicate branches appeared once more, and waved about. There were sea urchins and crabs in the pool. The crabs were of all sizes. They scuttled in and out among the seaweeds.

“Crabs are found all over the world,” said their mother. “There are a great many different kinds. In some warm countries there

are crabs bigger than you are, Philip. They wander around over the land and into the sea. They have sharp claws, too, nearly as big as your hand, Philip."

"He wouldn't try to lift one of those up by the claw, would he?" laughed Elinor.

"Think of meeting one of them! My! I'm glad they don't live around here," said Philip.

Suddenly their mother stooped down, with an exclamation.

"A hermit crab!" she cried. "Yes! It is a hermit crab!"

The children bent over until their faces nearly touched the water. This time they saw, scampering over the floor of the pool, a shell, round and white like those they had seen on the beach sometimes. But this shell had legs, and instead of crawling slowly along on one spreading foot, like some that they had seen, it was running along quite fast.

"Oh! A shell with legs! How funny!" cried Elinor.

"See it run!" cried Philip.

Two large forelegs stuck out of the hole of the shell, and a curious-looking head. It did



not look at all like any shell that they had seen before.

“That is a hermit crab, children,” said Mummy. “He has helped himself to a shell that once belonged to someone else, and has taken it for his own home. He carries his house on his back, you see.”

“But why did he do it, Mummy?”



The hermit crabs which live in these large shells always have large, rough claws.

“The hermit crab’s shell is very soft. His back has no protection at all. So he has to find a shell that will take the place of one of his own. He picks out a shell that he likes the



looks of, gathers himself together, and then jumps into it, as quick as a wink. If it fits, he stays there, squeezing himself down into it snugly. He places his big front claw over the opening, and it makes a capital door! There he is, 'as snug as a bug in a rug,' and when he wants to come out he sticks out his head and forefeet, looks about, and if the coast is clear, off he runs, his shell on top of his back, and his soft body inside."

"Well, I never —!" exclaimed Elinor, who had been listening breathlessly.

"By and by, perhaps, he grows bigger," went on her mother. "The shell becomes too small. So he looks about, finds another shell that he likes, quite different, it may be, from the other; he jumps into it, quickly, and, if it is a fit, he is quite satisfied. Isn't that funny?"

"Why! Why!" was all the children could find to say, they were so surprised.

"Sometimes a sea anemone fastens itself on to his shell, and they all travel about together. And seaweed, too, often clings to his shell. He is well protected then. No one would ever guess he was a crab."

*Splash! Swish!*

A ripple of water stirred the pool, and eddied about. Then another came. The pool wakened into new life. Everything in it seemed, somehow, to be aware of a change. The cold tide water sweeping into the warm water of the pool, which had been lying in the sun for several hours since the tide had left it, must feel strange to the tiny creatures living in it. But it was not only the coolness of the water that the living creatures felt. The fresh tide water was full of new life; living things, so tiny as to be all but invisible; food for the hungry mouths that had exhausted the supply in the pool.

The starfishes began to stir a little, ever so little at first. A leg stretched slowly out; then another. The starfishes began to look really like stars, and not a tangle of violet, red, and crimson legs. One of the starfishes floated glidingly forward, without apparent effort. How good that fresh salt water was!

The seaweed floated gently to and fro as though waking from a nap. The crabs grew excited and raced back and forth. A tiny red sea eel wriggled about.

*Boom! Splash! Splash!*

A great wave came rushing up and dashed itself against the rock, covering the children and their mother with salt spray. They had been standing with their backs to the sea, looking into the pool, and had not noticed how fast the tide was coming in. The rocks below them were already under water.

*Boom! Boom! Splash-sh!*

“Hurry, children! These rocks are covered at high tide. We should not have stayed so long!” cried their mother, leading the way from rock to rock until they were well out of reach of the waves.

“Oh, but I’m glad we stayed!” cried Elinor.

“So am I!” sighed Philip.

As they hurried over the slippery seaweed — none too soon, for the tide was on the point of surrounding them — they saw many jelly-fishes lying stranded on the seaweed and pebbles.

A few days before they had seen many of them floating in the water near shore, the design plainly visible on their shining, wet surfaces.

“We didn’t bring home the hermit crab!” cried Philip, regretfully.

"It wouldn't wait for us. Besides, it was alive. We couldn't bring it home," said Elinor.

"But you will not forget him, will you?" asked their mother, as they came to the beach again.

"Oh, no, we shall not forget him," said the children.

"Look at the lovely beach, dears. You will not forget that, either, even if you do not see it again, will you?"

"No! Our dear beach!" cried both children, looking up and down it.

"This may be our last day on the beach this year," said Mummy.

Then they all went rather sadly along the shining sand, up the plank walk, down the hill, through the Green Gate, along the garden walk, and into the big white house.

That night, when the children were ready for bed, they asked for a story, as they had done so many times before.

"This will be the last story-poem. What shall I tell you about, dears?" asked Mummy.

"Oh, about a hermit crab!" cried Elinor.

"Yes, about a hermit crab!" cried Philip.

So she told them about the Hermit Crab.



## HERMIT CRAB

Said a Hermit Crab, "This borrowed shell  
Has fitted till now extremely well;  
But I find that I'm growing so big and stout  
I shall be penned in if I don't look out!  
I think I will take a walk today,  
And find a new shell without delay."

So he walked and he walked, and he soon caught  
sight  
Of a shell all shining and round and white.  
"Oho!" cried the Crab, "what a handsome  
shell!

I think it will suit me very well!"  
So he gathered himself, and with one swift dash  
He leaped within, as quick as a flash!

He squeezed down into it, bit by bit,  
And stretched to make sure 'twas a perfect fit,  
Then over the opening he placed his claw —  
A neater front door you never saw!  
His soft little back, with no covering on it,  
Pushed in like a head going into a bonnet.

Then he opened the door and he put out his head.  
“My new home is perfect!” the little Crab said.  
Out stretched his big claw, then his walking  
claw-feet;

“Now I’m hungry!” he cried, “I’ll get something to eat!”

With his home on his back, in a very gay mood,  
He ran toward a sea pool in search of some  
food.

# SILENT READING DIRECTIONS FOR THE GREEN GATE TO THE SEA

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It is the purpose of this chapter to bring out some of the more intangible aims of instruction in silent reading, and to show how the material of this book may be used to further such aims.

The soundest basis for interest is satisfying first-hand experience related to the content, topic, or setting of the reading matter, and a realization of the possibility of further satisfaction. Most children have had some first-hand experience with sand, water, shells, waves, or animals. Most children are not satiated with such experiences. They are full of curiosity about natural phenomena and eager for the adventures of new, vicarious experiences. That is the psychology upon which this book is based.

School reading experiences should provide the impetus to inquiry or observation as well as to appreciation ; to study as well as to enjoyment. This purpose requires extensive silent reading.

Individual differences in rate must be taken into account in planning silent reading activities (a) so that the slow reader realizes that his slow rate keeps him from privileges reserved for those who finish earlier ; (b) so that the rapid reader is not required to dawdle ; (c) so that all may be reading at their own rates rather than keeping the place while others read ; (d) so that experiences may be enriched for those who are able to read ; (e) so that pupils of meager ability may not be confused by fragments of unsuccessful mental experience, or perhaps strained by the application of one rate standard to all.

Individual differences in comprehension and appreciation are also inevitable, because of varied combinations of endowment, temperament, experience, sex, and maturity. They cannot be

set aside but should be reflected in (a) flexible treatment of reading material — not one ironclad method or procedure; (b) variety of content and material; (c) variety of appeal and response; (d) varied amounts of re-reading, review, or training.

The right use of this book will further the following aims:

Children should come to consider reading as (a) a mode of vicarious experience; (b) a worth-while leisure activity; (c) a source of ideas or a stimulus to thought and expression; (d) an experience with ideas in the order or sequence determined by an author or by a selective purpose.

#### SUGGESTED SILENT READING EXPERIENCES TO ACCOMPANY EACH CHAPTER

**I. The Sea Beach.** After a brief perusal of the book, during which the name of the author and the table of contents are noted, introduce the first story by reading as far as the sentence, "Oh, where do you suppose it leads to?" Re-read the sentence, directing your question to some pupil. Let other children answer, trying to anticipate or foretell the answer. Let them read far enough to see whether their anticipation was correct. See whether they know where to stop. Let them raise hands to show you (1) where they stopped and (2) what the path led to.

Let those who get these answers correct go on (1) reading and (2) following directions or questions like the following to be placed on the board as soon as the children begin to read:

1. Do not do these things until you have shown your teacher where the path led to.

2. Read on in this story until you come to something you would like to draw a picture about. Draw your picture so that it tells something that really happened in the story. When your picture is finished, go on with the story.

3. When you finish the story look at the pictures again. Then close your book and think about the tides and the sea.

Do not let all children have time to finish, so that those who are slow readers may feel a real urge to read faster, and those who finish early may not be required to waste time.

Let children discuss their illustrations. If two or more chil-



dren choose to illustrate the same part of the story, the best picture should be selected by the class. Arrange the pictures in the order of occurrence in the story. Discuss parts of the story which were not illustrated. If there is an interest in completing the series, appoint (from those who have finished reading) a group of illustrators to re-read parts of the story and complete the picture series. Let the other children who have finished reading help you to arrange a surprise for the illustrators. Meanwhile, children who still have a portion of the story to read may be allowed to complete it and then follow blackboard directions.

The surprise may consist of a series of "puzzles" or questions. These should either be worked out by the group, or individually after the children get the idea in one or two examples. Children should be free to skim through the story again for a portion adapted to the purpose. This explanation and discussion should give pupils the idea and enlist their eager search for material:

"Let's make some puzzles or questions. Here are some:"

(Write them where the children can see them.)

1. What made a noise like a cannon?
2. What is sand made of?
3. What makes stones smooth?

(Ask) — "Can you make more puzzles?"

Additional puzzles may be written on little individual slips or dictated to the teacher who writes them directly on a wall chart or blackboard. A chart or large sheet of paper is preferable because it can be preserved for future reference.

The "puzzle makers" may then adjourn to see whether they can answer their own queries; or they may put their queries to the other group. If children express questions not answered in the story, they can be helped to find answers by observing nature, or by seeking information from books and other sources.

Illustrations of the story should be signed by their makers, numbered and named by the group. Illustrations which are not true to the story should be changed or improved. If sheets of uniform size are used, these may then be fastened together in booklet form.

Perhaps some children will have had interesting seashore experiences. These should be related to the group if possible.

Children who have been accustomed to formal oral reading recitations will be slower to adjust to a situation in which silent individual application alternates with free group activity.

In the case of individuals who have been accustomed to reading at their own rates and have demonstrated the capacity and desire to read books *through* for the content, it may be wise to use this book in still another way, requiring fewer related activities and less evidence of comprehension.

**Little Green Pebble.** Children will enjoy this poem more if it is read orally by the teacher, or by someone who is able to invest the reading with certain feeling values which denote and arouse appreciation. The charm of rhythm and rhyme, and the euphony of well chosen words may thus be communicated to the child. Formal analysis, questions of fact, intensive drill and review should be most carefully *avoided* in the case of *verse*.

The children may wish to hear the selection again. That is one index of appreciation. Children can quite appropriately be asked to select the part they like best. This reaction in terms of choice is a most worth-while mode of appreciation. Children may then wish to express their appreciation of a particular bit of the poem by reading that bit or portion aloud. They may suggest other forms of expression. They may ask who wrote the "story in verse," and even try to express themselves in poetic forms. A lovely original line or couplet at this stage is enough unless more comes without effort or pressure. If the school day contains a period for rest or relaxation, and it is customary to start this period with a requested song, verse, or story, this offers another means of ascertaining whether this or other selections are truly appreciated.

If some of the children are permitted to take books home, group activities will be less satisfactory. It is quite right to reserve some things for group reading, if there is also adequate provision for individual reading. Further suggestions assume group treat-

ment. They are indicated briefly because of a number of considerations, some of which are here mentioned :

1. So many possibilities have been described in connection with the preceding units that general lines of suitable activity have already been indicated.

2. There is a danger that teachers will study the suggestions and assume that they must be carried out in detail without regard to pupil reactions which may indicate the need for variation to suit conditions.

3. The teacher's own initiative as well as that of the children may find expression in other ways of reaching the same objectives.

4. It may be entirely appropriate to get pupils *into* a book by cultivating enthusiasm. Thus the first part may be introduced in a manner which will build an urge to completion. When such an urge makes itself manifest on the part of a considerable number of pupils, it is a wise teacher who knows how to fade into the background, or give her attention to those who have not turned on their own motive powers. With the latter, teachers need help in their most serious obligation, namely, *interest building*. As educational guides and students of the developing child, teachers must face the problem of the unresponsive or poorly motivated child, and work out ways of arousing satisfying activity, as for instance (a) providing one or more magnifying glasses; (b) having children look at sand or other minute specimens of sea life; (c) suggesting that they draw what they see through the glass.

II. **The Crab.** Before beginning on this unit, children may give opinions as to whether the story goes on, or whether the selection is a separate unit of content. If there is disagreement, children should be asked to read until they find out, and rise when ready. No child should need to read more than two lines to make sure. The child who turns the page and reads on is perhaps not playing fair, but is yielding to an overpowering impulse to get on with the story. This is, of course, no serious crime, but either an indication of developing interest or an unsocial lapse. As an unsocial lapse, it should usually receive immediate attention in order that children may realize the significance of group action



and the need for inhibiting individual impulses, but still see the appropriateness of individual reading for their own enjoyment at other times.

With able classes, the whole "Crab" story may well be read at a single sitting. As children finish their reading, time should be noted or they should be ranked with reference to rate of reading.

More precise measures may also be made. The total number of words in the crab story is 1580. The teacher may say:

"I wonder whether you would like to read the 'Crab' story through to yourselves? I wonder how long it would take to read every bit of the story? Suppose you all begin to read right now."

(After two minutes) — "Please stop and show me with your finger just where you stopped reading. I see some of you will need more time than others. I am making marks to show where you stopped."

After all children's books have been marked the teacher says:

"Now put a slip of paper into your book as a bookmark. Write your name on it. I shall collect the books and figure out how much time each person would need to finish the story. Then, tomorrow, we shall see whether we can find time for everyone to finish the story." (Or children may count words read in two minutes and divide by two to get rate in words per minute. Then, with the table on page 160, they may find how long it will take them to finish.)

On the basis of words read per minute during the two minutes, the teacher may ascertain the approximate time required by each child for the whole story. Children who read less than sixty words per minute seldom derive much genuine satisfaction from independent silent reading of long units. They seldom comprehend adequately when struggling along alone. Precise rate standards cannot be interpreted to apply to non-test material, but it is entirely possible to use part of an unstandardized selection as an informal rate test and compare the results with data from standardized tests. Thus by using the "Crab" selection on a number of children the following data were secured for comparison with Courtis rate norms for silent reading:



	<i>Rate, in Words per Minute.</i>
Courtis Grade III norm . . . . .	113
Average of Grade III pupils on "Crab" selection . . . . .	105
Courtis Grade IV norm . . . . .	145
Average of Grade IV pupils on "Crab" selection . . . . .	131
Courtis Grade V norm . . . . .	168
Average of Grade V pupils on "Crab" selection . . . . .	162

Thus it may be seen that the "Crab" selection is just a trifle more difficult than the Courtis Test stories. This indicates that it is easy enough for most third-grade pupils and may even be enjoyed by the exceptional reader in the second grade. In grades above the third all pupils should be able to read the book silently.

Children can learn to estimate the time required to read a given number of words, lines, or pages, and to realize improvement from such objective evidence. For the teacher's convenience, the time requirements have been worked out and are given in the following table. The nearest whole minute should be used.

<i>Rate, in Words per Minute.</i>	<i>Minutes Required to Read 1580 Words.</i>
60	2 <sup>1</sup> + 24
70	2 + 21
80	2 + 18
90	2 + 16
100	2 + 14
110	2 + 12
120	2 + 11
130	2 + 10
140-150	2 + 9
160-170	2 + 8
180-210	2 + 6
220-250	2 + 5
260-280	2 + 4
290-300	2 + 3

<sup>1</sup> Children start where they left off, having already read during two of the total number of minutes.

While rate expressed in " words per minute " makes differences in amount read seem small, the great differences in time required to read long units should make low rate a matter of concern. Perhaps this explains differences in amount of voluntary reading. If comparisons are to be made on the basis of test results, there should, of course, be no preparatory discussion or explanation to supplement the directions as given to the test cases, nor should children be urged to read fast or to put forth unusual effort.

Questions on the chapter were used to test the comprehension of pupils. Complete directions are here given with these questions in the form of a questionnaire. Two of the children tested out in the preliminary trial of these questions made perfect scores of 20 points. One was in the third grade and read at the rate of 98 words per minute. The other was in the fifth grade and read only 82 words per minute. Both were deeply interested in the story. The lowest score (13) was made by a fourth-grade child who read 158 words per minute. She has never been to the seashore and she has not shown deep interest in reading. Most of the children tested scored 15 points, and all were able to correct wrong answers independently by reference to the book.

Shortly before this informal test, all children had been given the three standardized reading tests of the Stanford Achievement Tests for which age norms are available. These tests show that a reading age of ten years is adequate for the independent comprehension and enjoyment of the stories in this book. It should of course be remembered that less ability is necessary when the book is used with guidance.

#### DIRECTIONS TO CHILDREN

*(To be given orally by the teacher.)*

"Sometimes we read to find out, and sometimes we read just to get the story. Which were you doing?" (Designate one or two children by name and wait for replies.)

"Did you enjoy the story? Did you find out some things you never knew before?" (Encourage a few brief replies.) "Don't start to tell me *what* you *did* find out. There are so many things

to tell, and so many of you, that we should waste time waiting to take our turns. There is a quicker way of finding out. It is a way used by grown people in offices, and other busy places. Have you ever heard of a questionnaire?" (Put the word on the board.) "What do you suppose it is? Well, here is a questionnaire about this story. When you have filled in the blanks, I will tell you how busy people find out a great many things in a few minutes by means of a questionnaire." (The questionnaire may be on the blackboard or on mimeographed sheets; or children can turn to questions in this part of the book and use a questionnaire answer blank on which there are places for name, date, grade, and age, and blank spaces after the numbers of questions 1 to 19.)

"I am passing out the questionnaires but must ask you to leave them face down on your desks until I say, 'Begin.'"

"Now listen, so that you may do everything as it is supposed to be done. Read each question carefully, and answer it as well as you can. If you are sure you cannot answer, leave the space blank, and go on. Answer briefly. Do not use more words than you need to answer each question.

"There should be no talking while you are at work. Begin."

(After the children get to work, post a blackboard assignment for those who finish early.)

The teacher should have a key or answer sheet prepared in advance. Answers which are not clearly correct make good material for a verification lesson in which the children use their books. Make group decisions on such answers. Pupils whose *answers* are not so clear as their *ideas*, may thus learn to say just what they mean if they wish to be understood.

The data on each question and on each child should then be tabulated by the class as is done in questionnaire studies. Significant conclusions may well be reached by the children who study the tabulated data for evidence.

Questions like the following lead to careful reading and aid in the discussion and interpretation of tabulated data on rate and comprehension:

1. Which questions seemed to be the hardest?
2. Which children seem to read most carefully?
3. Which ones seem to skip while they read?
4. Which ones get wrong ideas?
5. Is it true that the fast readers make the most mistakes?
6. Is it true that the slowest readers are the best readers?
7. Which children should be asked to re-read the selection and find correct answers? While such children are re-reading and correcting their work, the others may make up a story about one of the illustrations or draw pictures of the various crabs. Such picture series should be preserved, in booklet form. Each picture should have a legend or title.

## QUESTIONNAIRE

NAME \_\_\_\_\_ GRADE \_\_\_\_\_ DATE \_\_\_\_\_

1. Who went to the beach in this story?
2. Was the tide coming in or going out at the beginning of the story?
3. Did the tide turn while they were at the beach?
4. What was the first thing the children did?
5. Who cried?
6. Why?
7. Did the children find oyster shells?
8. What is funny about crab shells?
9. What makes the air bubbles that come up when the waves retreat?
10. How would you pick up a rabbit?  
Did you read about that in this story?
11. How would you pick up a crab?
12. Why?
13. What is queer about a crab's eyes?
14. How does a crab run?
15. How many legs has a crab?
16. Are baby crabs just like grown-up crabs, but smaller?
17. Why did they look at the white rock?
18. Where were the children at the end of the story?
19. What was going to happen next?



*Scoring Directions.* Mark wrong answers X and omissions O ; correct answers score 1 ; disregard the answer to the first part of Number 10. In the first question, give 2 points, if the answer is complete, and 1 point if correct but incomplete. The total possible score is 20 points.

**Mr. Crab.** This rhymed dialogue should be used playfully. The children may participate by reading the first part of the first and second lines. The teacher then reads the balance of the selection. Children may pretend to pick up the crab and let it go at the appropriate point in the fifth stanza. They may also say the last " Good-by " at the end. The children should have a real crab to observe, if possible. They may study the illustrations and then make a set of crab pictures themselves.

**III. The Starfish.** In this selection, the fitness of the title is not immediately apparent. Tell the children to read the first paragraph, or read it aloud to them. Then ask, " Is it about starfish? What is it about? " Ask whether the children would like to play the game of " Finding Out " with each page or paragraph. Ask each one to answer the two questions to himself as he reads.

Children should see a preserved starfish or good pictures of live starfishes. The part of the selection that tells of the variety of lovely colorings may lead children to make colored drawings of these little sea animals in their habitat.

**Asteria.** The meaning of this word will interest the children. It may suggest imaginative compositions on such topics as :

Why the Starfish Looks Like a Star.

The Starfish Who Lost a Point.

The Adventures of the Sea Maiden, Asteria.

Such original compositions are suitable as oral reading material. Children read their stories to the class in a true audience situation.

**IV. The Horseshoe Crab.** Both the prose and verse selection should be read. The feasibility of floating seaweeds on cards may be discussed. This may lead to vacation work. Children from eight to ten years of age have been known to enjoy this experience and to make very creditable collections.

**V. The Sea Urchin.** The question, " What shall we find to-

day? " may lead to conjectures on the part of the children who then read to see whether their anticipation is correct.

This selection contains a thrilling incident which should be read without a break or interruption. The children may then illustrate or discuss the incident or ask questions on related geographical problems. An informational reference reading lesson may be advisable if these questions are sufficiently worth while. Such assignments to reference books should be specific and definite. Each child should be allowed to report his findings to the class.

This selection also contains a list of things found by Elinor and Philip. Children may be assigned to make a list of this sort while reading. The children who make full or complete lists could be allowed to go on while others re-read to make their lists complete. Sketches to illustrate the list may be made and placed with those of previous selections.

#### GENERAL SUGGESTIONS FOR REMAINING CHAPTERS

From this point on it may well be advisable to let children read by themselves, with just enough of a test of comprehension to make sure that they are getting the meaning as they go. Brief sets of questions on each chapter may be typed or copied on cards and filed. Two or three copies of each set will suffice as children will not all need them at the same time. When a child finishes a selection, he should go to a file, get the question card which pertains to his selection, and answer orally or on a slip of paper. If his answers are satisfactory, he may be allowed to go on with the next selection. Certain children may be assigned or allowed to illustrate each selection in some way. The illustrations may then be assembled and put in booklet form or added to the frieze suggested in connection with the first story in the book. Questions on Chapter VII, "The Sand Dollar," are suggested below. Similar sets of questions may be prepared for the remaining chapters.

- Questions.* 1. Did they find a silver dollar in the sand?  
2. What did they have to try three times before they succeeded?

3. What new thing did they find for their collection? 4. Was it alive?

#### FINAL QUESTIONS

*(To be asked of children who complete the book.)*

1. Which of all the rhymes did you like best? 2. Which of all the stories? 3. Of all the things which Philip and Elinor did, which would you like best to do? 4. See how many little seashore animals you can name. 5. Look at all the pictures and try to remember the names of the animals. 6. Then try again, to see whether you can name more of the little animals.

#### FINAL SUGGESTIONS

The whole class may reorganize the content of the book and present it as an informational entertainment for another class. The accumulated illustrations may be utilized for such a purpose.

Some of the pictures in each child's book may be masked by putting paper windows over the pages, allowing only the pictures, without the legends, to show through. Each child's book should show a different picture or pictures. A game of picture recognition may thus be utilized. Children respond by giving the name of the pictured animal or by numbering a list of names to accord with the number placed on the picture frame, below the illustration in the book.

If possible, children should make a collection of real specimens, and use the pictures and descriptions in the book for purposes of identification. An identification game like the following will lead to re-reading and make the content of the book a source of further interest and investigation:

One child describes one of the creatures or specimens without naming it. Other children volunteer to show the picture and name the specimen. Each response is verified. The first child to respond takes his turn at description.

The best educational uses of this book are those which, combined, lead to the widest growth. Formal training should be subordinated with material so rich in content and so full of stimulus to investigation and activity.



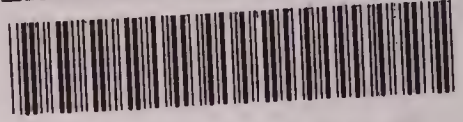








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